

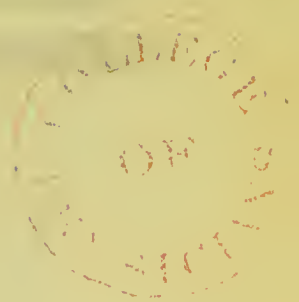
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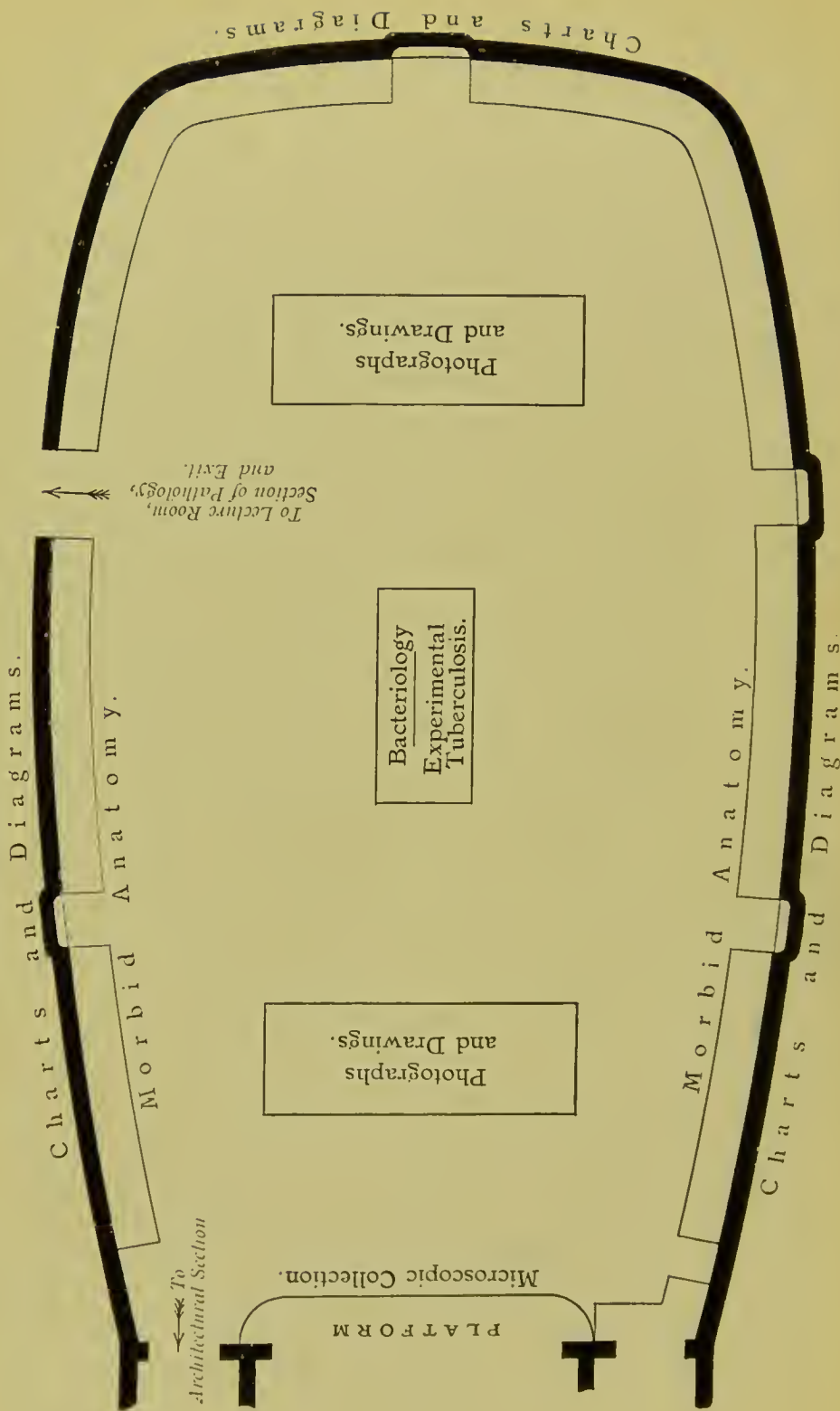
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BRITISH CONGRESS ON TUBERCULOSIS, - 1901.

PLAN OF MUSEUM.



Scale: 10 feet to 1 inch.

QUEEN'S SMALL HALL.

Adlard & Son, Printers: London & Dorning.

Presented with the compliments of the

Organising Council of the British Congress on Tuberculosis.

105.C

DESCRIPTIVE CATALOGUE

OF THE

MUSEUM

OF THE

BRITISH CONGRESS ON TUBERCULOSIS

HELD IN

London, July 22nd to 26th, 1901.

Compiled and Edited

BY

W. JOBSON HORNE, M.D.,

Hon. Secretary to the Museum Committee.



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BACTERIOLOGY OF TUBERCULOSIS, HUMAN AND ANIMAL,

AND OF

DISEASES ALLIED TO OR SIMULATING TUBERCULOSIS.

I. CULTURES OF THE TUBERCLE BACILLUS.

Isolated from a case of Miliary Tuberculosis on August 15th, 1881.

By PROFESSOR ROBERT KOCH, M.D.

(*Institut für Infektionskrankheiten, Berlin.*)

Five culture tubes containing pure cultures of the Tubercle bacillus inoculated on the 20th June, 1901.

This culture was originally obtained on the 15th August, 1881, from a case of miliary tuberculosis in a man. Since that date it has undergone 435 sub-cultures without again being passed through the body of an animal.

II. CULTURES OF BACILLI OF THE TUBERCULOSIS GROUP, AND OF ACID-RESISTING BACILLI SIMULATING THE TUBERCLE BACILLUS.

Demonstrated by Dr. LYDIA RABINOWITSCH,
Berlin Institut für Infektionskrankheiten.

1. Bacillus of human tuberculosis.
2. Bacillus of bovine tuberculosis (Perlsucht, Tuberculose des bovidés).
3. Bacillus of avian tuberculosis (Geflügeltuberkulose, Tuberculose des oiseaux).
4. Culture obtained by *Arloing-Courmout* (Lyon) by means of repeated transplantation of the bacilli of human tuberculosis. Attenuated culture, used for serum diagnosis of tuberculosis.
5. Bacillus of fish tuberculosis (*Tuberculosis piscium*). Isolated by *Bataillon Dubard* and *Terre* (Dijon) from a tumour of a carp. The fish was found in a pond infected with tuberculous sputum. Grows best at 22 to 25° C.
6. Bacillus of blindworm tuberculosis (Blindschleimentuberkulose). Isolated by *Moëller* from the spleen of the blindworm, infected with tuberculous sputum. Grows best at 22° C.
7. Acid-resisting bacillus simulating *Bacillus tuberculosis*. Isolated by *Rabinowitsch* from a case of gangrene of the lungs. Cultures obtained from the sputum and from the gangrenous focus.
8. Acid-resisting bacillus simulating the *Bacillus tuberculosis*. Isolated by *Marpmann* from urine.
9. Acid-resisting bacillus simulating the *Bacillus tuberculosis*. Isolated by *Mironesco* (Berlin) (not yet published) from human fæces.
10. Acid-resisting bacillus simulating the *Bacillus tuberculosis*. Isolated by *Karlinski* (Maglaj, Bosnien). From nasal secretion.
11. "Timothy" bacillus. Isolated by *Moeller* from Timothy grass (*Phleum pratense*).
12. "Grass" bacillus. Isolated by *Moeller* from the dust of grass.
13. "Mist" bacillus. Isolated by *Moeller* from the manure of cattle, horses, goats, pigs, and donkeys.

14. Acid-resisting bacillus simulating the bacillus tuberculosis. Isolated by *Rabinowitsch* from milk and butter.
15. Acid-resisting bacillus simulating the bacillus tuberculosis. Isolated by *Hormann-Morgeuroth* (Berlin) from butter.
16. Bacillus "Friburgensis," I. Isolated by *Korn* (Freiburg in Br.) from butter.
17. Bacillus "Friburgensis," II. Isolated by *Korn* (Freiburg in Br.) from butter.
18. Acid-resisting bacillus simulating bacillus tuberculosis. Isolated by *Grassberger* (Wien) from butter.
19. Acid-resisting bacillus simulating the bacillus tuberculosis, I. Isolated by *Tobler* (Zürich) from butter.
20. Acid-resisting bacillus simulating the bacillus tuberculosis, II. Isolated by *Tobler* (Zürich) from butter.
21. Acid-resisting bacillus simulating the bacillus tuberculosis, III. Isolated by *Tobler* (Zürich) from butter.
22. Acid-resisting bacillus simulating the bacillus tuberculosis, IV. Isolated by *Tobler* (Zürich) from butter.
23. Acid-resisting bacillus simulating the bacillus tuberculosis, V. Isolated by *Tobler* (Zürich) from butter.

MICROSCOPIC SPECIMENS.

1. Sections of the udder of a tuberculous cow showing tubercle bacilli in the tissue.
2. Specimen of milk containing true tubercle bacilli (bacilli found in the sediment after centrifuging).
3. Specimen of milk containing bacilli simulating bacillus tuberculosis (bacilli obtained as above).
4. Specimen of the sputum of a case of gangrene of the lungs showing bacilli simulating bacillus tuberculosis.
5. Smear specimens of different tissues of a guinea-pig, which was inoculated with butter containing bacilli simulating bacillus tuberculosis.

III. CULTURES, PREPARATIONS AND DRAWINGS OF BACILLI OF THE ACID-FAST GROUP SIMULATING THE BACILLUS OF TUBERCULOSIS.

Isolated and demonstrated by A. MOELLER, M.D.

Belzig bei Berlin.

1. Timothy bacillus (*Moeller*).—Habitat: On various grasses used as fodder (*Phleum pratense*, *Bromus erectus*, etc.). The Timothy bacillus, morphologically and on being stained, is a micro-organism that resembles the tubercle bacillus. It grows on all nutritive media, best at an incubation temperature. In animals usually experimented upon it provokes a tuberculous affection.
Objects for exhibition:—(a) Cultures; (b) Preparations of organs; (c) Microscopical preparations; (d) Drawings.
2. Grass bacillus II (*Moeller*).—A micro-organism similarly found on fodder grasses. Morphologically throughout of somewhat coarser form than the Timothy bacillus. It manifests one special peculiarity in its tendency to grow out in long rodlets and ramifications. It grows on the usual culture media even in the temperature of a room; more quickly at an incubation temperature. When employed to produce pathogenic effects on animals it manifests special virulence in milk cultures.
Objects for exhibition:—(a) Cultures; (b) Photographs.
3. Butter bacillus (*Petri Rabinowitsch*).—A micro-organism isolated from butter, morphologically and on being stained similar to the tubercle bacillus. It grows on the usual culture media in a room temperature, more speedily at an incubation temperature. Its pathogenic effect on animals is severe when it is injected with butter.
Objects for exhibition:—Cultures.
4. Milk bacillus (*Moeller*).—A micro-organism isolated from milk; acid and alcohol proof. In morphology as well as cultivation resembling the grass bacillus II.
Objects for exhibition:—(a) Cultures; (b) Drawings.
5. Excrement bacillus (*Moeller*).—Isolated from the excrement of herbivora. In morphology and staining a micro-organism resembling the tubercle bacillus. Requirements for growth and pathogenic effects similar to those of the grass bacillus II.
Objects for exhibition:—Cultures.

6. Slow-worm bacillus (*Moeller*).—Cultivated from the spleen of a slow-worm infected with tuberculous sputum. In morphology and staining similar to the tubercle bacillus. Optimum of temperature for growth is 22° C. In the case of warm-blooded animals not pathogenic.

Objects for exhibition:—(a) Cultures ; (b) Microscopical preparations ; (c) drawings.

IV. THREE MICRO-PHOTOGRAPHS (LANTERN-SLIDES) OF CULTURES OF THE BACILLUS OF TUBERCLE (HUMAN), OBTAINED BY CULTIVATING, AT ORDINARY TEMPERATURES, UPON STERILISED PAPER, MOISTENED WITH CONDENSED AQUEOUS VAPOUR FROM HUMAN BREATH, AND FROM GROUND-AIR.

By ARTHUR RANSOME, M.D., F.R.S.

They show deviations from ordinary cultures (1) in the abundance of "gigantesque" forms ; (2) in the large proportion of bacilli clubbed at one or both ends ; (3) in the presence of branched forms.

V. A COMPARATIVE SERIES OF CULTURES.

By HAROLD SWITHINBANK.

From the Denham Research Laboratory.

- A. SERIES OF FLASK CULTURES ILLUSTRATING THE HITHERTO SUPPOSED DIFFERENT VARIETIES OF TUBERCLE BACILLI, ACID-FAST BACILLI, ORGANISMS OF PSEUDO-TUBERCULOSIS AND PATHOGENIC STREPTOTHRICES, AT DIFFERENT STAGES OF GROWTH.

Medium, nutrient agar, with five per cent. added glycerine, and an alkalinity equivalent to '028 per cent. of NaOH, with litmus as indicator. (Acid to phenolphthalein requiring '046 per cent. of NaOH for neutralisation.)

Varieties of Bacillus Tuberculosis.

1. *Bacillus tuberculosis*. *Koch*.

Incubation at 37°C. for—

(a) Three weeks.

(b) Two months.

(c) Three months.

2. *Bacillus tuberculosis avium*. *Maffucci*.
Incubation at 39°C. for—
 - (a) One month.
 - (b) Two months.
 - (c) Three months.
3. *Bacillus tuberculosis piscium*. *Dubard*. Isolated by Dubard from tuberculous lesions in the Carp after continued ingestion of human tuberculous sputum.
Incubation at 22° C. for—
 - (a) One month.
 - (b) Six weeks.
 - (c) Two months.
4. *Bacillus tuberculosis* (blindschleichen). *Moeller*. Isolated by Moeller from internal organs of blind-worm (*anguis fragilis*). Inoculated twelve months previously with human tuberculous sputum.
Incubation at 22° C. for—
 - (a) Ten days.
 - (b) Three weeks.
 - (c) Six weeks.

Types of Acid-fast Organisms other than Bacillus Tuberculosis.

5. Butter bacillus of *Rabinowitsch*. Acid-fast bacillus isolated by L. Rabinowitsch from butter.
Incubation at 22° C. for—
 - (a) Three weeks.
 - (b) Six weeks.
 - (c) Two months.
6. Butter bacillus of *Binot*. Acid-fast bacillus isolated from butter by Binot (cf. *Bac. tuberculosis*).
Incubation at 22° C. for—
 - (a) Ten days.
 - (b) Three weeks.
 - (c) Six weeks.
7. Butter bacillus of *Grassberger*. ('Münchener medic. Wochenschrift,' 1899, No. 11). An acid-fast organism isolated by Grassberger, and believed by him to be identical with the "Butter bacillus" of Morgenroth and Hormann.
Incubation at 22° C. for—
 - (a) Ten days.
 - (b) Three weeks.
 - (c) Seven weeks.

8. Timothy bacillus. *Moeller*. Acid-fast bacillus isolated by Moeller from Timothy grass (*Phleum pratense*).

Incubation at 22° C. for—

(a) Ten days.

(b) Three weeks.

(c) One month.

9. Bacillus smegmatis. *Kruse*. Acid-fast bacillus isolated by Kruse from preputial smegma.

Incubation at 37° C. for one month.

Types of Pseudo-tubercle Organisms.

10. Bacillus pseudo-tuberculosis. *Pfeiffer*. (Syn. Strepto-bacillus pseudo-tuberculosis rodentium. *Preis*. Pseudo-tuberculose zoogléique, *Malassez et Vignal*.)

Incubation at 37° C. for—

(a) Ten days.

(b) Three weeks.

(c) One month.

11. Aspergillus fumigatus. *Fresenius*. *Pseudo-tuberculose aspergillaire*. An aspergillus pathogenic to man, and the causal agent in a disease simulating phthisis, and common amongst the professional *gaveurs* of pigeons for the markets of Paris. Examination of sputum shows no trace of the Bacillus tuberculosis, but large quantities of the mycelial threads and spores of this aspergillus. The system of *gavage* consists in the filling of the mouth with a mixture of grain and water, and the forcing of the mixture down the throat of the pigeon, the beak being placed in the operator's mouth. The spores of the mycelium exist probably on the grain.

Incubation at 37° C. for—

(a) Three weeks.

(b) Six weeks.

Pathogenic Streptothrices.

12. Streptothrix farcinica. *Rossi-Doria*. (Syn. Bacille du farcin du bœuf, *Nocard*. Actinomyces bovis farcinicus, *Gasperi*. Nocardia farcinica, *Toni et Trevisan*. Oospora bovis, *Sauvageau et Radais*.)

Incubation at 37° C. for—

(a) Ten days.

(b) Three weeks.

(c) Seven weeks.

13. *Streptothrix Eppingeri*. *Rossi-Doria*. (Syn. *Cladothrix asteroides*, *Eppinger*. *Actinomyces asteroides*, *Gasperini*. *Oospora asteroides*, *Sauvageau et Radais*.) Isolated by Eppinger from cerebral abscess in case of cerebro-spinal meningitis, the pus containing this organism alone.

Incubation at 37° C. for—

- (a) Ten days.
- (b) Three weeks.
- (c) Seven weeks.

14. *Streptothrix maduræ*. *Vincent*. (Syn. *Cladothrix maduræ*). The causal agent in the tropical disease known as Madura Foot. Isolated by Vincent.

Incubation at 37° C. for—

- (a) Ten days.
- (b) One month.
- (c) Two months.

15. *Streptothrix Deci*. Isolated by Deci from case of cerebro-spinal meningitis.

Incubation at 37° C. for—

- (a) Three weeks.
- (b) Six weeks.
- (c) Two months.

16. *Streptothrix capræ*. *Silberschmidt*. Isolated by Silberschmidt from a supposed case of tuberculosis in the goat.

Incubation at 37° C. for—

- (a) Ten days.
- (b) Three weeks.
- (c) Six weeks.

17. *Streptothrix Actinomyces*. *Rossi-Doria*. (Syn. *Actinomyces bovis*, *Hartz*. *Actinomyces bovis sulphureus*, *Gasperini*. *Oospora bovis*, *Sauvageau et Radais*. *Nocardia actinomyces* of *Toni et Trevisan*.) The causal agent in actinomycosis.

Incubation at 37° C. for—

- (a) Fourteen days.
- (b) One month.
- (c) Six weeks.

- [18. *Streptothrix nigra*. Non-pathogenic. *Exhibited for comparative purposes only*.]

- [19. *Streptothrix odorifera*. Non-pathogenic. *Exhibited for comparative purposes only*.]

B. CULTURES OF ABOVE ON POTATO AND SLOPED AGAR SHOWING RESULTS OBTAINED BY LONG SUCCESSION OF CULTURES ON MEDIA UNVARYING IN COMPOSITION OR REACTION.

The object of this further exhibit is to show the effects of a different medium—viz. potato,—upon the same species of organisms as those already dealt with, and also the variations produced in growths over a long succession of subcultures on nutrient glycerine agar of unvarying composition and reaction. As the species are the same as in the previous exhibit, it has not been thought necessary to catalogue them *in extenso*. Each specimen is, however, clearly labelled.—H. S.

C. CULTURES ON POTATO OF BACILLUS TUBERCULOSIS (HUMAN) AFTER EXPOSURE TO LIQUID AIR FOR A CONTINUOUS PERIOD OF FORTY-TWO DAYS.

- (a) An original culture before exposure to liquid air.
- (b) Subculture made after exposure of organisms to liquid air for forty-two days without actual contact, the containing tube being immersed only.
- (c) Subculture made after exposure to liquid air for forty-two consecutive days with contact, the containing tube being both immersed in, and filled with, liquid air during the whole period.

Note.—The temperature of liquid air may be taken at— 193°C .; the temperature to which the organisms were actually exposed during the whole period as— 186°C .

D. ACTINOMYCOSIS.

- (a) Desiccated potato culture growths of *Streptothrix Actinomyces* of the year 1893.
- (b) Culture in bouillon of one of above after eight years' desiccation.
- (c) Subculture on glycerine agar from above bouillon culture.

Note.—From the year 1893 to the year 1901 inclusive the desiccated cultures were preserved in tubes stoppered with cotton wool in such a manner as to allow free access of air without risk of outside contamination.

VI. CULTURES (FORMALISED) OF STREPTOTHRICES ON
VARIOUS MEDIA.

Shown by ALEXANDER G. R. FOULERTON, F.R.C.S., and C. PRICE JONES, M.B.

(From the Middlesex Hospital Bacteriological Laboratory.)

1. *Streptothrix hominis* (Berestnew).
2. *Streptothrix luteola* (Foulerton).
3. *Streptothrix hominis* (Sabrazès and Rivière).
4. *Streptothrix bovis communis* (*Actinomyces bovis*, Bollinger and Harz).
5. *Streptothrix maduræ* (Vincent).
6. *Streptothrix eppingeri* (Eppinger).
7. *Streptothrix nocardii* (Nocard).
8. *Streptothrix capræ* (Silberschmidt).
9. *Streptothrix hominis* (Foulerton).
10. *Streptothrix alba* (Rossi Doria).
11. *Streptothrix leucea* (Foulerton).
12. *Streptothrix leucea saprophytica* (Foulerton).
13. *Streptothrix alpha* (C. Price Jones).
14. *Streptothrix cinereo-nigra aromatica* (Berestnew).
15. *Streptothrix violacea* (Rossi Doria).
16. *Streptothrix orangica*.
17. *Streptothrix erythrea* (Foulerton).
18. *Streptothrix beta* (C. Price Jones).
19. *Streptothrix nigra* (Rossi Doria).
20. *Streptothrix nigrescens* (*Cladothrix dichotoma*, Cohn and Macè).
21. *Streptothrix odorifera* (Rullman).
22. *Streptothrix graminearium I* (Berestnew).
23. *Streptothrix gabritschewskii* (Berestnew).
24. *Streptothrix melanotica* (C. Price Jones).
25. *Streptothrix pluricolor* (Terni).

VII. CULTURES, AND PREPARATIONS TO ILLUSTRATE THE CHEMISTRY OF THE TUBERCLE BACILLUS.

By WILLIAM BULLOCH, M.D.

(From the London Hospital Bacteriological Laboratory.)

1. Preparation of tuberculosis of the liver and spleen of a fowl.
 2. Culture of mycobacterium phlei (Timothy grass bacillus).
 3. Culture of mycobacterium tuberculosis hominis.
 4. Preparations to illustrate the chemistry of the tubercle bacillus.
 - (a) Dried culture of bacillus tuberculosis.
 - (b) Bacilli after extraction of fat.
 - (c) Fat of tubercle bacillus.
 - (d) Wax of tubercle bacillus.
 - (e) Residue after extraction of proteids, fats, and wax.
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EXPERIMENTAL TUBERCULOSIS.

VIII. PREPARATIONS DEMONSTRATING THE RESULTS OF INOCULATING CATTLE WITH BACILLI OF BOVINE AND HUMAN TUBERCULOSIS.

Exhibited by Professor ROBERT KOCH, M.D., and Professor WILHELM SCHÜTZ, M.D.

(From the Collection in the Pathological Institute of the Royal Veterinary College, Berlin.)

CALVES.

1. Glandular cervicalis superior et trachealis inferior of a healthy calf.
2. Tuberculosis at the site of inoculation in the neck; tuberculosis of the adjacent glandula cervicalis superior dextra et glandula trachealis inferior dextra of a calf inoculated subcutaneously with the bacilli of bovine tuberculosis, and dying 49 days later.

At the post-mortem examination there was further discovered tuberculosis of the lungs, liver, spleen, and kidneys, as well as of the whole of the lymphatic glands.

3. Tuberculosis of the spleen of the same calf.
4. Tuberculosis of the lungs of a calf inoculated subcutaneously with bacilli of bovine tuberculosis, dying 77 days after the injection.

There was in addition discovered at the post-mortem caseous deposit the size of two fists at the site of inoculation in the right lumbar region ; tuberculosis of the glandula inguinalis superficialis dextra, of the glandulæ iliacæ internæ, lumbales, renales, mesentericæ ; tuberculosis of the spleen, of the liver, of the glandulæ hepatis, of the glandulæ mediastinales, bronchiales, axillares, cervicales, superficiales, tracheales et submaxillares.

Remark.—The calves inoculated subcutaneously with human tuberculosis had an inconsiderable swelling at the site of inoculation in which virulent tubercle bacilli were demonstrated to be present ; otherwise, however, they remained healthy during a period of observation extending over eight months.

5. Tuberculosis of the lungs in a calf inoculated intra-venously with bacilli of cattle tuberculosis, and dying 26 days after the injection. At the post-mortem there was further shown to be tuberculosis of the liver, spleen, and kidneys.
6. Tuberculosis of the lungs in a calf inoculated intra-venously with the bacilli of cattle tuberculosis, and dying 100 days after. In addition the post-mortem showed tuberculosis of the pleura, of the pericardium, of the spleen, liver, kidneys, and the whole of the lymphatic glands.
7. Tuberculosis of the spleen of the same calf.

Remark.—The calves inoculated intravenously with the bacilli of human tuberculosis showed at the post-mortem, made eight months later, a perfectly normal condition of all organs.

8. Tuberculosis of the omentum of a calf inoculated intra-abdominally with the bacilli of cattle tuberculosis, and slaughtered 100 days after the injection. The following appearances were further revealed at the post-mortem :—softened tuberculous mass in the abdominal wall, tuberculosis of the glandulæ iliacæ dextræ et sinistræ, and of the glandula inguinalis superficialis dextra, of the peritoneum, of the glandulæ mesentericæ portales et renales, of the liver, of the pleura, and of the glandulæ bronchiales, mediastinales et tracheales inferiores.

Remark.—The calves inoculated intra-abdominally with the bacilli of human tuberculosis remained healthy during an observation period of eight months.

PIGS.

9. Glandula retro-pharyngealis et glandulæ mesentericæ of a healthy pig.
10. Tuberculosis of a glandula retro-pharyngealis and of the glandulæ mesentericæ of a pig fed for 75 days with the bacilli of cattle tuberculosis. The pig was slaughtered 109 days after the commencement of feeding with tuberculous material.

The post-mortem further showed tuberculosis of the glandulæ submaxillares, tracheales, cervicales superficiales, bronchiales, mediastinales et portales, of the lungs and of the liver.

Remark.—The pigs fed with the bacilli of human tuberculosis remained healthy.

11. Tuberculosis of the lungs of a pig inoculated intra-venously with cattle tuberculosis, and slaughtered after 135 days. At the post-mortem there was found further tuberculosis of the glandulæ tracheales, bronchiales, mediastinales, portales, of the liver and spleen.

12. Tuberculosis of the lungs of a pig inoculated intra-venously with the bacilli of human tuberculosis, and slaughtered after 100 days. At the post-mortem only the glandulæ bronchiales et mediastinales appeared tuberculous, while all the remaining organs were in their normal condition.

Remark.—The pigs inoculated subcutaneously and intra-venously with bacilli of human tuberculosis remained healthy, whilst the pigs inoculated subcutaneously and intra-venously with the bacilli of cattle tuberculosis became ill with general tuberculosis.

SHEEP.

13. Tuberculosis of the lungs of a sheep inoculated intra-venously with the bacilli of cattle tuberculosis, and slaughtered after 63 days. Through the post-mortem examination there was further shown tuberculosis of the liver, spleen, and kidneys, as well as of all the lymphatic glands.

Remark.—The sheep subcutaneously inoculated with bacilli of cattle tuberculosis became diseased in a similar manner.

14. Tuberculosis of the lungs of a sheep intra-venously injected with the bacilli of human tuberculosis, and slaughtered 63 days after the injection. In the grey tubercles of the lungs no tubercle-bacilli could be shown microscopically. All the remaining organs were of a normal nature.

Remark.—The sheep infected subcutaneously with the bacilli of human tuberculosis remained healthy.

IX. PREPARATIONS ILLUSTRATING EXPERIMENTAL AND NATURAL TUBERCULOSIS IN ANIMALS (ROYAL COMMISSION ON TUBERCULOSIS, 1895).

By PROFESSOR SIDNEY MARTIN, M.D., F.R.S.

(From the Museum of University College.)

1. Acute caseous tuberculosis of lung of rabbit, following subcutaneous inoculation with tuberculous milk. Tubercle bacilli found in the deposits.
2. Kidney of the same rabbit from which the last specimen was taken, showing projecting tubercles.
3. Portion of liver of pig, showing an area of caseo-calcareous and encapsuled tubercles, the result of feeding with tuberculous milk. Tubercle bacilli were found in the deposits.
4. Spleen of pig showing projecting tubercles, the result of feeding with tuberculous milk.
5. Portion of small intestine of calf, showing tuberculous nodules in Peyer's patch eroded on the surface, the result of feeding with tuberculous milk. Tubercle bacilli were found in the deposits.
6. Calcareous tuberculous nodules in intestine of calf, the result of feeding with tuberculous milk. Tubercle bacilli were found in recent nodules in other parts of the intestine.
7. Tuberculous affection of Peyer's patches and mucous membrane of intestine of guinea-pig, the result of feeding with tuberculous milk. Tubercle bacilli were found in the deposits.
8. Portion of udder of cow showing extreme caseo-calcareous tubercle (the natural disease).
9. Lymphatic gland of cow, showing advanced fibro-caseo-calcareous tubercle (the natural disease).

X. PREPARATIONS ILLUSTRATING EXPERIMENTAL TUBERCULOSIS IN ANIMALS.

By SAMUEL G. SHATTOCK.

(From the Museum of the Royal College of Surgeons.)

1. A guinea-pig into the subcutaneous tissue of the right thigh of which 5 c.c. of a suspension of tubercle bacilli in sterilised salt solution were injected. The culture was raised on glycerinised potato from the lymphatic glands of a guinea-pig, infected with the sputum of a phthisical patient, the animal dying in six weeks. The guinea-pig was killed with chloroform fourteen days after inoculation, at which date there was a firm local swelling at the site of the injection, but no ulcer. The preparation shows a small localised eminence beneath the skin at the seat of inoculation, and enlargement (from secondary tuberculous infection) of the superficial and deep inguinal glands, as well as of the lower lumbar glands. The glandular enlargements are confined to the side of inoculation. Neither the spleen nor other viscera are as yet involved.

R.C.S. Museum, 4914.

2. A guinea-pig showing the results of a similar experiment made at the same date. The animal was killed with chloroform twenty-one days after the inoculation. The same enlargement of the inguinal and lumbar lymphatic glands of the side corresponding with the subcutaneous injection (the right) has taken place; but in addition the spleen presents an early stage of disease in the form of miliary tubercles. The various other viscera are as yet intact.

R.C.S. Museum, 4915.

3. A guinea-pig which was experimentally infected at the same date as, and like the preceding, by the subcutaneous injection of a pure culture of the tubercle bacillus into the right thigh. The animal was killed with chloroform, on the thirty-fourth day after inoculation. A subcutaneous nodule, not ulcerated, has formed at the site of the inoculation, and the inguinal, lumbar, and retro-hepatic glands are enlarged. The infection of the spleen is more advanced than in the foregoing specimen, and the liver has, in addition, become involved; but the lungs are as yet unaffected.

R.C.S. Museum, 4916.

4. A guinea-pig which was experimentally infected with tuberculosis, as in the three foregoing specimens, the animal being killed on the forty-seventh day. There is the same local swelling (the skin in this case being ulcerated for a small area over it), and enlargement of lymphatic glands as in the other preparations. The disease of the spleen has progressed considerably farther; the liver is involved, but the kidneys are unaffected. In addition to this, the mediastinal and bronchial glands are considerably enlarged, and both lungs present a few tuberculous foci.

R.C.S. Museum, 4917.

XI. PREPARATIONS ILLUSTRATING EXPERIMENTAL TUBERCULOSIS AND PSEUDO-TUBERCULOSIS IN ANIMALS.

FROM THE MUSEUM OF ST. BARTHOLOMEW'S HOSPITAL.

1. A guinea-pig showing the lesions of tuberculosis. The anterior wall of the thorax has been cut away and the intestines removed. The original seat of inoculation, the right groin, shows a local abscess immediately beneath the skin. The lymphatic glands adjacent are greatly enlarged and caseous; the glands along the aorta and iliac vessels are also affected. The liver shows numerous large caseating tubercles; the spleen is greatly enlarged, and is full of tubercles. There are a few tubercles in the lungs, and some very minute miliary tubercles can be seen in the omentum.

The animal died eight weeks after inoculation with a small fragment of tissue from an ulcer of the conjunctiva, which was suspected to be tuberculous in nature. A positive diagnosis was made twenty-four days after inoculation by finding numerous tubercle bacilli in the pus from the local abscess. See 'Ophthalmic Ward Notes' (1900), No. 1672.

St. Bart.'s Hosp. Museum, 3239C.

Pseudo-tuberculosis.

2. A guinea-pig which has been laid open to show the thoracic and abdominal viscera *in situ*. It exhibits, in the lungs, spleen, and liver, numerous whitish nodules, which bear an extremely close resemblance to tuberculous lesions. There is further, in the right groin, at the seat of inoculation, a large caseous mass resembling a tuberculous abscess. The lesions are, however, not due to the tubercle bacillus, but to the *Bacillus pseudo-tuberculosis* of Pfeiffer. See 'Histological Records,' 1, 3239D. Presented by Dr. E. Klein, F.R.S.

St. Bart.'s Hosp. Museum, 3239D.

XII. ENDOTHELIAL PROLIFERATION OF CAPILLARIES IN THE IMMEDIATE VICINITY OF INOCULATED TUBERCULOUS MATTER.

By ARTHUR WHITFIELD, M.D., and LENTHAL CHEATLE, C.B., F.R.C.S.

The specimen is taken from the subcutaneous tissue (guinea-pig) which immediately surrounded a piece of tuberculous human lymphatic gland, with which the animal was inoculated forty-eight hours before it was killed.

In the field, under the microscope, can be seen a dilated capillary, the endothelial cells lining which are swollen, and one of them is undergoing mitosis. One twelfth oil immersion.

XIII. THE INOCULATION OF ANIMALS AS A MEANS OF DIAGNOSIS IN TUBERCULOUS PHTHISIS.

By the late WILLIAM MARCET, M.D., F.R.S.

A series of water-colour drawings illustrating the results of experiments by the late William Marcet, full details of which will be found in his communication to the Royal Medical and Chirurgical Society of London on May 14th, 1867, in which reference is made to the discovery by Dr. Villemain ('Gazette Hebdomadaire,' December, 1865, November, December, 1866) that tuberculous phthisis can be inoculated from man to animals.

MORBID ANATOMY AND PATHOLOGY OF TUBERCULOSIS.

XIV. HUMAN.

TUBERCULOSIS OF BONE AND ORGANS OF LOCOMOTION.

The specimens numbered 1 to 35 are formalin preparations lent from the Charing Cross Hospital Museum. The classification is that adopted by Dr. William Hunter to demonstrate the process of tuberculous inflammation and its effects in bone. For purposes of comparison specimens of normal bone and of bones affected with disease other than tuberculosis are exhibited.

The classification is as follows: (*the numbers used in the catalogue of the Charing Cross Hospital Museum are added*).

Osteo-myelitis, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74.

Periostitis, 65, 67, 69, 70.

Osteitis.

(a) Formative (Sclerosis Hyperostosis), 65.

(b) Rarefaction, 62, 63, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74.

(c) Caries, 62, 63, 64, 65, 66, 67, 68, 69, 71, 72, 75, 77.

(d) Necrosis, 66, 67, 68, 71, 72, 74.

Osteomyelitis, Caries, and Caseation (Tibia), Rarefying Osteitis.

1. A slice of the upper end of a tibia affected with tuberculous disease—natural colours preserved—showing cancellous tissue acutely congested, and infiltrated with granulation tissue and three areas of caseation, the bone itself rarefied. The disease has extended to the joint above; the articular cartilages are destroyed by ulceration; the semilunar cartilages are also ulcerated; and the synovial membrane is chronically inflamed and thickened. Presented by Mr. Boyd, 1897.

Charing Cross Hosp. Museum, 62.

Osteomyelitis, Osteitis (Rarefying), Caseation, Caries.

2. Another slice from the same bone lower down, showing similar changes, viz. infiltration with granulation tissue, rarefaction of the cancellous tissue, and caseation in three places. (The specimens illustrate the effects of chronic tuberculous osteomyelitis.) Presented by Mr. Boyd.

Charing Cross Hosp. Museum, 63.

Chronic Osteomyelitis, Caries, Rarefying Osteitis of Epiphysis of Femur.

3. Vertical section through the bones and soft parts of the knee-joint of a child aged three; showing a focus of tuberculous disease (infiltration and caseation) in the centre of the lower epiphysis of femur. Natural colours preserved. The synovial membrane within the joint is seen to be thickened; the cartilage over condyle of femur thin and ulcerated at two points. At the outer aspect of the joint is seen the red pouting end of a sinus leading down to the diseased bone.

History.—L. S., æt. 3, admitted with a history of pain and swelling in left knee of four to five months duration. An abscess formed, and was opened and scraped, but subsequently the leg was amputated on account of burrowing abscesses, which ran up the thigh between the crureus and vasti muscles. Presented by Mr. Bloxam, April 2nd, 1897.

Charing Cross Hosp. Museum, 64.

Chronic Osteomyelitis, Osteitis, Caries and Periostitis, Epiphysis of Femur.

4. Other half of the same joint as preceding; natural colours preserved. The same localised tuberculous area is seen in epiphysis of femur; but in this, the disease is seen to extend down to the joint—the cartilage over condyle being ulcerated. A large sinus is seen to extend down from this ulcerated bone to the front; while on the outer side there is the opening of smaller sinus which leads up under the tissues of the thigh. The periosteum over lower end of femur is chronically thickened (tuberculous periostitis). Epiphysis of tibia is healthy; but there is slight ulceration of the cartilage covering it.

Charing Cross Hosp. Museum, 65.

5. Osteomyelitis of metacarpus and carpus. Rarefying osteitis.

Charing Cross Hosp. Museum, 65A.

Osteomyelitis, Caries, Rarefying Osteitis, and Necrosis of Head of Tibia.

6. A horizontal slice off the upper end of a tibia affected with tuberculous disease; showing in cross section a large sequestrum which has formed in the centre of a softening and rarefying area of tuberculous disease, with caries of the bone around. The articular semilunar cartilages are extensively destroyed by ulceration. Presented by Mr. Boyd, 1896.

Charing Cross Hosp. Museum, 66.

Caries and Necrosis of Condyle of Femur.

7. A vertical section through a portion of the condyle of the femur from the same case as the preceding; showing the bone partly carious, partly necrosed, this latter forming a wedge-shaped portion abutting on joint surface. The articular cartilage is extensively ulcerated. Natural colours preserved. Presented by Mr. Boyd.

Charing Cross Hosp. Museum, 67.

Chronic Osteomyelitis, Rarefaction, Caries, Necrosis, Lower Shaft of Tibia.

8. A tibia and fibula: the lower end of the shaft of the former affected with tuberculous disease; natural colours preserved. The lower end for a distance of one and three quarters of an inch from epiphysis is expanded by rarefaction of the bone; the periosteum is thickened. In its centre is seen a yellow caseous mass, one half by three eighths of an inch across, the bone tissue around looking red and inflamed. During life a sequestrum half an inch long was removed by operation from the bone through the opening seen on its outer (fibular) side. Epiphysis not affected.

William B., æt. 2, admitted for swelling of ankle of fifteen weeks' duration. On admission, ankle swollen; sinus behind external malleolus leading to dead bone. Subsequently another sinus formed behind internal malleolus. The sequestrum was removed and the cavity scraped. Patient died of tuberculous meningitis. Mr. Boyd's case. P.M. 2062, October 16th, 1898.

Charing Cross Hosp. Museum, 68.

Chronic Osteomyelitis, Caseation, Caries, Periostitis and Osteitis of Sacrum.

9. A sacrum and coccyx vertically bisected, showing extensive tuberculous disease, affecting the lateral processes of sacrum. The cancellous tissue presents an acutely inflamed, red, gelatinous appearance; and an abscess cavity has formed in the hollow of the sacrum—the anterior wall of the sac being formed by greatly thickened periosteum. At one part a caseous mass is seen, and the walls of the cavity are covered with a greyish-yellow slough.

Post-mortem.—Sacral caries; sinuses; amyloid kidney and spleen; ulcerative endocarditis. Old sinuses back of right hip and buttock, leading down to hollow of sacrum. An abscess cavity in hollow of sacrum; front wall of sac formed by indurated tissues, back wall by sacrum, the bone of which is ulcerated; carious; covered with caseous material. Lateral process of sacrum rarefied; cancellous tissue red and gelatinous, at one part a caseous mass. Mr. Boyd's case, M. M., æt. 59, admitted June 3rd; died June 9th, 1899. P.M. 2196.

Charing Cross Hosp. Museum, 69.

Chronic Osteomyelitis (with Rarefaction) and Periostitis of Femur.

10. A vertical section through the lower end of a femur; from a case of chronic tuberculous disease of knee-joint. Natural colours of tissue preserved. The bone is soft, cutting easily with a knife; the periosteum over it greatly thickened, easily detachable from bone, and showing the underlying compact bone red and inflamed. The cancellous tissue is filled with red, gelatinous-looking granulation.

Charing Cross Hosp. Museum, 70.

11. Advanced chronic tuberculous disease of diaphysis, head of tibia, abscess in bone.

Charing Cross Hosp. Museum, 70A, 70B

Chronic Osteomyelitis, Caseation, Caries, Necrosis of Vertebrae (Pott's Disease).

12. Lower portion of spine of a child, vertically bisected; natural colours preserved; showing well-marked tuberculous disease of the bodies of the fourth and fifth lumbar vertebrae. The bodies of each of these vertebrae is hollowed out to form a cavity filled with caseous material, in the midst of which lies a large sequestrum. The caseous material is in great part removed, but the adjacent bone around it is soft and carious.

Kathleen N., æt. 6. No family history of phthisis; "delicate" for three years; treated at Great Ormond Street Hospital for spinal disease eighteen months previously. Admitted for tuberculous meningitis; fourteen days' duration.

Post-mortem.—Tuberculous meninges and lung; a large abscess, filled with thick curdy pus, over right psoas muscle, extending down to Poupart's ligament, communicating by a sinus with diseased vertebrae. Dr. Green's case P.M. 1948, March 1st, 1898.

Charing Cross Hosp. Museum, 71.

13. Other half of same specimen.

Charing Cross Hosp. Museum, 72.

Chronic Osteomyelitis, Rarefying Osteitis, with Central Necrosis of Os Calcis

14. Os calcis divided vertically into two parts, showing extensive tuberculous disease. Only a small area of the cancellous tissue remains at the posterior part, presenting a soft and rarefied appearance. The greater part of the bone has undergone necrosis *en masse*, forming a large sequestrum of white colour occupying anterior three fourths of bone. Natural colours preserved. Presented by Mr. Boyd, 1899.

Charing Cross Hosp. Museum, 74.

Chronic Osteomyelitis, Rarefying Osteitis of Head of Ulna.

15. Upper two thirds of an ulna, the head of which shows the above-mentioned changes, as the result of tuberculous disease. The disease is limited to the head of the bone, which is considerably expanded. The shaft of the bone below site of disease is much atrophied (from disease).

Charing Cross Hosp. Museum, 73.

Caries of the Lower Extremity of the Femur.

16. The lower extremity and part of the shaft of a femur (left).

The patient was a boy æt. 10, who was in the hospital for disease of the knee-joint. The knee was much swollen, and upon being examined was found to be so extensively diseased that the thigh was amputated. The external condyle was almost entirely destroyed. The boy recovered and left the hospital. (*Vide* Surgical Reports, Mr. Bloxam's case, 1899.)

Charing Cross Hosp. Museum, 75.

17. Caries of astragalus.

Charing Cross Hosp. Museum, 77.

18. Carious disease of os calcis, removed by operation by Mr. Hancock.
Case related in 'Proceedings of Westminster Medical Society,' p. 26.

Charing Cross Hosp. Museum, 82.

19. Osteomyelitis, rarefying osteitis, of os calcis.

Charing Cross Hosp. Museum, 82*a*.

20. Abscess in head of tibia (tuberculous).

History.—F. J., æt. 12. Operation January 18th, 1900.

At end of summer, 1899, noticed a swelling of left knee, with tenderness; confined to bed for two weeks, and then knee was operated upon. Soon after the operation the right leg became affected (in what way is not stated in the history), and this also was operated upon. At both operations bone was removed, but the wounds have made no attempt at healing.

On admission a sinus discharging pus was present over the inner condyle of the right femur and extended back to the bone. The skin in front of the left tibia is occupied by an unhealthy ulcer, extending from about two inches below the lower border of the patella to about four inches from the ankle-joint, and about two inches wide; foul discharge, large granulations with a sinus leading three inches upwards into head of tibia. The knee-joint is swollen and boggy in consistence, but not painful on manipulation. The superior tibio-fibular articulation is disorganised, the fibula moving freely backwards and forwards on manipulation.

At operation (January 18th, 1900), sinus over tibia enlarged, and eight to ten small pieces of dead bone removed and cavity scraped, and afterwards packed with gauze. On January 20th knee became more swollen, and on March 2nd had increased, and the skin over it was tense and shining. On aspiration a little sero-purulent fluid was drawn off. On March 8th amputation of lower third of femur. Left knee-joint much distended with fluid, but synovial membrane intact; stump healed April 27th, 1900.

Charing Cross Hosp. Museum, 82*b*, 82*c*.

Specimens Exhibited for Comparison.

- 21, 22. Normal bone

Charing Cross Hosp. Museum, 1 and 4.

23. Simple inflammation of bone.

Charing Cross Hosp. Museum, 36*A*.

- 24—27. Suppurative inflammation.

Charing Cross Hosp. Museum, 37, 38, 39*a*, 39*b*.

- 28—31. Syphilitic disease of bone.

Charing Cross Hosp. Museum, 83, 84, 85, 86.

- 32—35. Rickets.

Charing Cross Hosp. Museum, 121, 122, 123, 124.

*TUBERCULOSIS OF VERTEBRÆ (POTT'S DISEASE).**From a Patient under the Care of Percival Pott (1779).*

36. Section of a spine with angular curvature. The disease is situated in the middle of the dorsal region ; large portions of the bodies of two vertebræ have been destroyed by caries. A soft caseous matter is deposited around the diseased bone, and is so abundant in front and at the side of the spine, that it elevates the periosteum of the vertebræ and the pleura costalis in the form of a tumour within the chest. A small piece of bone is separated from the rest by necrosis, and is embedded in the caseous matter behind the various vertebræ. The spinal cord for the space of an inch and a half is compressed in the situation of the curvature.

The patient was under the care of Mr. Pott, and had paraplegia and other signs of "Pott's disease" of the spine and spinal cord. It was one of the first cases which showed the benefit of issues in the treatment of the disease, for under their influence the paraplegia and other symptoms were completely removed, and the patient recovered so as to walk with ease. He died with phthisis.

St. Bart.'s Hosp. Museum, 1097.

37. The six upper cervical vertebræ with portions of the occipital and sphenoid bones, showing strumous disease, which has produced angular curvature. The bodies of the vertebræ are extensively affected with caries, and the intervertebral substances have been destroyed by ulceration. The basilar portions of the occipital and of the sphenoid bones have also been partially destroyed by caries, which has produced a large opening into the pharynx through which a bougie has been passed. The carious portions of bone were covered by a thick layer of scrofulous matter, deposited between the bone and dura mater. The scrofulous matter which covered the basilar process has been turned up with the dura mater, in the shape of a flap, which in the preparation stands perpendicularly above the bougie. The only remains of the transverse ligament are marked by two black bristles passed underneath it. Some strong bands belonging to the occipito-odontoid ligaments still serve to maintain the second vertebræ in its relations with the occipital bone ; but the connections between the second and third vertebræ are nearly all destroyed. The remaining portions of the affected bones are harder than natural. The scrofulous deposit between the second, third, and fourth vertebræ and the dura mater was very extensive, and produced pressure upon the spinal marrow. The spinal cord is preserved in a subsequent series.

St. George's Hosp. Museum, Series V, 2c.

38. Section of the upper part of the spine, of the occipital bone, and of the spinal cord. The connections of the second cervical vertebra with the first and with the occipital bone having been destroyed, apparently by ulceration, the anterior portion of the first vertebra and the basilar portion of the occipital bone have sunk down so that the lower margin of the first vertebra is within a line of the upper margin of the intervertebral substance between the second and the third ; and the whole of the odontoid process of the second projects straight upwards into the cavity of the skull. The medulla oblongata is thus lifted up and stretched over the apex of the odontoid process ; and as the pons holds its connection with the basilar portion of the occipital bone, the axis of the medulla oblongata forms a right angle with the axis of the spinal cord. The displaced bones are held together by the thickened and consolidated adjacent tissues. Their texture appears indurated, but not otherwise diseased.

The patient was a woman æt. 32. The most prominent sign of the disease, which was of four years' duration, was a constant acute pain at the back of the neck just below the occiput. She had some difficulty of swallowing, and used to sit with her chin on her hand, or resting on her sternum. But she suffered no loss of sensation, and was able to walk on the day before her death. Some of the dorsal vertebræ were also affected with caries. Presented by John Avery, Esq.

St. Bart.'s Hosp. Museum, 1092.

39. A sagittal section of a cervical spine showing extensive caries of the first and second vertebræ. The atlas is displaced forwards, and between its anterior arch and the odontoid process there is an abscess-cavity, half an inch across, lined with granulation tissue. This cavity extends downwards, forming a retro-pharyngeal abscess, and in the recent state it communicated by a small opening with the pharynx. The bodies of several of the vertebræ are infiltrated with inflammatory material, and within the spinal canal there is a deposit of lymph outside the dura mater as well as upon the upper portion of the spinal cord. The second cervical nerve at its exit is surrounded by caseous material. The other half of the preparation is preserved in St. Mary's Hospital Museum.

From a girl æt. 19, who was admitted for caries of the cervical spine. Her illness began twelve years previously with pain on the top of the head. Subsequently she suffered severe pain in the occipital region and along the cutaneous branches of the cervical plexus, which was treated as neuralgia. On admission there was fixation of the head, great prominence of the spine of the axis, and a retro-pharyngeal abscess. The abscess was opened behind the sterno-mastoid muscle, but the patient gradually became comatose, and died. Presented by Edmund Owen, Esq., 1893.

R.C.S. Museum, 2064B.

40. The upper half of a spine, in which the bodies of the fifth and sixth cervical vertebræ are completely, and those of the fourth and seventh partially, destroyed by ulceration. The intervertebral fibro-cartilages, between these vertebra, as well as those between the first four dorsal vertebræ,

are completely destroyed, and the bodies of the dorsal vertebræ are superficially ulcerated. There is an angular curvature in the lower part of the cervical region, and the remains of one of the bodies of the vertebræ project far into the spinal canal. From a child æt. 10. There was a large collection of matter in front of the spine pressing the pleuræ inwards. Presented by J. G. Perry, Esq.

St. Bart.'s Hosp. Museum, 1095.

41. Section of lower dorsal and upper lumbar vertebræ, showing disease of transverse and spinous processes, producing lumbar abscess, the bodies remaining entire. The disease extends into the canal, some inflammatory deposit being seen within it. At the back is seen the lumbar abscess, the lower rib passing along its upper margin.

Guy's Hospital Museum, 1026.

42. The bodies of two lumbar vertebræ showing tuberculous deposits in their centres and destruction of the surrounding bone. Presented by John Hilton, Esq., 1867.

R.C.S. Museum, 2068.

43. The dorsal and lumbar portions of a spine from a young person, exhibiting a nearly complete destruction of the intervertebral ligaments of the vertebræ. The bodies of several of the lumbar vertebræ are completely destroyed, and an angle is here formed by the approximation of the upper and lower parts of the column and the projection of the spinous processes. In the dorsal vertebræ the ulceration is superficial, though the intervertebral ligaments are very deeply destroyed. The bone in process of ulceration is not softened or otherwise changed in its apparent texture.

St. Bart.'s Hosp. Museum, 1071.

Osseous Anchylosis of, and Formation of New Bone on, the Vertebræ.

44. Portion of an occipital bone, with the three uppermost cervical vertebræ. The occipital bone, and the anterior half of the atlas, are firmly and completely united by bone. The second and third vertebræ are similarly ankylosed at their articular processes. These changes seem to have followed ulcerative disease, by which the odontoid process and the body of the second vertebra were changed in structure, and in part removed.

St. Bart.'s Hosp. Museum, 1075.

45. An atlas and axis. The odontoid process has been dislocated in such a manner as to leave only a very narrow space for the spinal cord, and the bones have subsequently become ankylosed. They were found in a graveyard at Aberdeen, and are described by Sir James Paget in the

'Medico-Chirurgical Transactions,' vol. xxxi (1848). Presented by George Banks, Esq.

St. Bart.'s Hosp. Museum, 1094A.

46. Section of the lower dorsal and first two lumbar vertebræ. The former, the seat of old disease, have their bodies broken down and crushed together. In this condition they have become consolidated. The spinal canal at and above the curve is slightly narrowed. The cord is here compressed, its antero-posterior diameter being less by nearly one fifth of an inch than immediately above or below.

The angular curvature was of slow formation. It occurred between the ages of eight and eleven years, about fourteen years prior to the death of the patient. There was no paralysis. Pneumonia was the immediate cause of death.

St. Bart.'s Hosp. Museum, 1102

47. A part of a spinal column extensively affected with caries, which implicates nearly all the dorsal and the two or three upper lumbar vertebræ. In the dorso-lumbar region is a sharp angular curvature, caused by the almost complete destruction of the bodies of five vertebræ, the remains of which are fused into an irregular spiculated mass. The bodies of the dorsal vertebræ above this part are extensively destroyed and perforated in many places by rounded foramina opening into the spinal canal. The destructive process has extended most deeply into the centres of the bodies; the normal concavity is therefore exaggerated, and the edges of adjoining vertebræ project as sharp ridges between the concavities. The right sides of the bodies are more extensively affected than the left. From a person æt. 26 years, who had suffered from lumbar abscess.

R.C.S. Museum. 2062A.

Process of Reparation.

48. Section of a spine, exhibiting the process of reparation after extensive disease. Twelve spinous processes are shown in the preparation, but the bodies of only four vertebræ; eight bodies, therefore, have been destroyed. The vertebræ above and below these eight have been approximated, and are firmly united by bone with their remains and with one another. An extremely acute angular curvature is thus produced, but the spinal cord, having adapted itself to the alteration in the direction of the spinal canal, has not been compressed.

St. Bart.'s Hosp. Museum, 1096.

49. Portion of the spine of a child, exhibiting the process of cure after caries. The bodies of four of the lower dorsal vertebræ are completely destroyed, and the anterior parts of the bodies of the vertebræ, which were immediately above and below the situation of the disease, are approximated

and firmly united by bone. Together with the angular curvature thus produced there is some lateral displacement of the bodies of the vertebræ, but, by the separation of the arches of the diseased vertebræ, the spinal canal, though changed in form, appears to have retained its natural size.

St. Bart.'s Hosp. Museum, 1099.

More Remote Effects of Spinal Caries.

50. A pylorus with a portion of the liver and the duodenum, showing close to the biliary papilla an oval perforation in the wall of the bowel, about a third of an inch long, which in the recent state communicated with a large spinal abscess.

Ellen M., æt. 24, was admitted under Mr. Davies-Colley for an angular curvature of the spine in the lumbar region, attributed to a fall experienced four years previously. Eight days after admission an abscess was opened in the back, the pus from which had a very fœtid odour. Eleven days later she died, and at the autopsy the fourth and fifth lumbar vertebræ were found to be carious, and the right kidney, with which the spinal abscess was in contact, was filled with caseous deposit. See 'Insp.,' 1885, No. 365; and 'Trans. Path. Soc.,' 1886, p. 561.

Guy's Hosp. Museum, 758.

51. A left kidney considerably altered in shape as the result of pressure. Between the hilum and the convex border it is flattened out so that its transverse diameter is no greater than the usual thickness of the organ.

Abraham H., æt. 35, was admitted under Dr. Bright in 1828 with extreme deformity of the spine, and died from general tuberculosis. At the autopsy an abscess was found just below the diaphragm associated with caries of the subjacent vertebræ. See 'Insp.,' vol. vi, p. 49; and 'Proc.,' 1026 (50) [2nd Edit.].

Guy's Hosp. Museum, 1586.

52. A portion of a right psoas muscle. Extensive suppuration, the result of the disease of the spine occurred; the ulceration spread from the walls of the abscess cavity into the external iliac artery, causing death from hæmorrhage. See 'Female Surgical Register,' vol. v. (1889), No. 2259*.

St. Bart.'s Hosp. Museum, 1171A.

53. A hip-joint from a young woman, in which the articular cartilages of the femur and acetabulum have been removed by ulceration, and the exposed surfaces of the bones are covered by soft granulations and flakes of lymph. The capsular ligament is thickened, and the head of the femur and the acetabulum appear enlarged. At the anterior and inner part of the capsule there is a large oval opening with smooth defined margins. This opening was immediately beneath the tendon of the psoas and iliacus muscles, in the situation at which the bursa naturally existing beneath that tendon sometimes communicates with the cavity of the hip-

joint. A large psoas abscess had long existed in this patient; and it seemed probable, that the pus, having passed under the tendon of the psoas and iliacus muscles, and through the aperture of communication between the bursa and the joint, had excited acute inflammation of the latter.

St. Bart.'s Hosp. Museum, 564.

STERNUM AND STERNO-CLAVICULAR JOINT.

Sternum.

54. Portions of a sternum and ribs. There is a large cavity in the sternum filled with caseous material. This cavity was closed in both behind and in front by a membrane, apparently the thickened periosteum, a part of which is now reflected.

St. Bart.'s Hosp. Museum, 120.

Sterno-clavicular Joint.

55. Scrofulous ulceration of the structure entering into the formation of the right sterno-clavicular articulation. The preparation consists of the upper part of the sternum, and the contiguous extremities of the clavicle and the first rib, with the adjacent apex of the lung. The ligamentous structures connecting the bones in front have been destroyed, as well as the interarticular fibro-cartilage, and the opposed surfaces of the bones are in a state of disorganisation, the sternal cavity of the first costal cartilage being partly destroyed and rounded off. The soft parts which remain about the joint are greatly thickened, and the apex of the lung is covered by thickened pleura, and contains a vomica with irregular walls. Extensive union between the contiguous surfaces of the pleura in this part has taken place. The preparation was taken from the body of Sarah F—, who died January 22nd, 1851. Before dissection this affection of the articulation was partially visible through an ulcer over it, about the size of half a crown. A preparation in a subsequent series shows scrofulous deposit in the uterus. 'Post-mortem and Case-book,' 1851, p. 14.

St. George's Hospital Museum, Series iii, 21A.

ELBOW-JOINT.

- 56 Elbow-joint extensively diseased. The whole synovial membrane is covered with lymph, and converted into a pulpy tissue; the articular cartilage is exfoliating in large pieces, and parts of the ends of the bones are carious, and olecranon detached.

Guy's Hosp. Museum, 1301⁵⁰.

57. The bones have become exceedingly light and spongy in texture ; they are altered in form, and the articular lamella covering both is destroyed, exposing the cancellous tissue. In the neighbourhood of the joint-ends much bony matter has been deposited, both on the humerus and ulna, but especially on the former.

St. George's Hosp. Museum, Series III, 17E.

58. Scrofulous disease of the elbow-joint, which was amputated in the Hospital in 1828. There are strong adhesions between the different surfaces of the joint, and there is a large portion of dead bone near the external condyle of the humerus. Bristles have been passed beneath this piece of bone, to show its separation from the living bone, which is almost complete. The adhesions are injected with size and vermilion, to show their vascularity. Presented by Sir Benjamin Brodie, Bart.

St. George's Hosp. Museum, Series III, 25C.

WRIST AND HAND.

59. Scrofulous disease of the bones of the carpus, and ulceration of the cartilages of the wrist and carpal joints, for which amputation was performed in the Hospital in 1827. Presented by Sir Benjamin Brodie, Bart.

St. George's Hosp. Museum, Series III, 18A.

60. The wrist of a man æt. 28, from which eight years previously the greater number of the carpal bones were removed on account of strumous disease of the joint. The hand retained very considerable power of flexion and extension. With the exception of the trapezium, pisiform, unciform, and part of the cuneiform bones, the carpal bones have been removed. These and the metacarpal bones have become adapted to the articular surfaces of the radius and ulna, and united to them by dense fibrous tissue, admitting of some motion at this part. This bond of union has been divided. The remaining bones appear healthy.

St. Bart.'s Hosp. Museum, 728.

Tuberculous Dactylitis.

61. A longitudinal section of a left forefinger affected with tuberculous dactylitis. Around the distal end of the first phalanx there is a large tuberculous deposit in the periosteum, which is most abundant on the dorsal surface beneath the aponeurosis of the extensor muscles. The osseous substance of the phalanx is also invaded. On the reverse of the specimen there is a projection caused by the softened tuberculous growth.

From a boy æt. 11, who first noticed a painful swelling of the forefinger five months before admission to a hospital. The ring-finger of the opposite hand had been amputated two years previously for a similar swelling. Presented by Edmund Owen, Esq., 1896.

R.C.S. Museum, 1245A.

62. The ring finger of the right hand, removed from a child *æt.* 3 on account of tuberculous disease of six months' duration.
St. Bart.'s Hosp. Museum, 3239B.

HIP-JOINT.

63. The head of the right femur of a child *æt.* 1 year, which has been cut across by an oblique incision. It is composed almost entirely of cartilage, in the centre of which is a small cavity containing caseous matter of tuberculous origin.

From a well-nourished male child who died of broncho-pneumonia. He had complained of pain in the joint for about a fortnight, though nothing could be made out by palpation. At the post-mortem examination the right hip-joint was found to contain pus, which had tracked up in the sheath of the psoas. Presented by W. P. Herringham, M.D.

St. Bart.'s Hosp. Museum, 121A.

64. A section of the head and neck of the right femur from a case of hip-joint disease in an early stage. The cartilage of the head of the femur and of the acetabulum has been in great part removed. The head of the bone is softened, but is not at all destroyed or altered in shape.

From a boy *æt.* 11, who had symptoms of hip-joint disease for eleven months before his death. The disease appeared to have commenced in the synovial membrane. See 'Male Surgical Register,' vol. ii (1886), No. 3613.*

St. Bart.'s Hosp. Museum, 564A.

65. The hip-joint of a child. The cartilage of the head of the femur, in a wide extent, has been separated from the bone after ulceration of thin layers of their contiguous surfaces. The ulceration of the bone has also extended irregularly down the inner part of the neck to below the lesser trochanter; the whole of this space is rough and covered with lymph or tuberculous matter. The round ligament has been destroyed, and large portions of cartilage have been removed from the acetabulum, leaving the rest with abrupt ulcerated margins, but closely connected with the subjacent bone. A portion of the capsule remains, and is covered with lymph. From the museum of Sir A. P. Cooper.

R.C.S. Museum, 1857.

66. The right haunch-bone, with a portion of the femur, from a case of hip-joint disease. The capsule has been divided, and the cartilage is undergoing ulceration, and can readily be separated from the subjacent inflamed bone. The ligamentum teres has entirely disappeared, and the synovial membrane is pulpy. The head of the femur is greatly altered in shape, but it is not necrosed, and was not dislocated during life. Presented by James Berry, Esq.

St. Bart.'s Hosp. Museum, 570B.

67. Extensive caries of the head of the femur and the acetabulum. Nearly the whole of the head of the femur has been destroyed, excepting a small portion which is connected with the neck. This portion occupied the cavity in connection with the upper part of the acetabulum, formed by absorption of its upper wall. The floor of the acetabulum in one part is cribriform, and almost entirely absorbed. The upper margin of the cavity presents an irregular deposit of new bone. The bones were very soft in the situation where ulceration was proceeding, and presented a worm-worn appearance. At the back of the inner surface of the ilium there is a small cavity, which contained some scrofulous matter; and on that portion of the ilium which enters into the formation of the sacro-iliac joint are two larger cavities containing portions of necrosed bone, and quite separated. This specimen was removed from the body of a man, George T., æt. 23, who was admitted into the hospital on July 19th, 1848, with well-marked symptoms of disease of the hip. Numerous abscesses formed in various situations after his admission, and discharged very profusely. He remained in the hospital several months, and died in a hectic state in February, 1849. St. George's Hosp. Museum, Series III, 14D.

Senile Tuberculosis of Hip-joint.

68. The left hip-joint, laid open from the front, and showing, as the result of prolonged suppuration, complete destruction of the head, and of a considerable proportion of the neck of the femur. The cartilage round the margin of the acetabulum is eroded, and there is a perforation at the deepest part of the socket, through which pus has tracked into the pelvis.

The patient was a woman æt. 53, who had suffered from pain in the left hip for nine months previous to her admission into the hospital. She then had all the signs of acute hip-disease. The joint was incised and pus evacuated. Her general health rapidly became worse, and she died three months later from exhaustion. The post-mortem examination showed that both lungs, both adrenals, the right kidney, and several abdominal lymphatic glands were the seat of advanced tuberculosis. See 'Female Surgical Register,' vol. iv (1890), No. 143.

St. Bart.'s Hosp. Museum, 570C.

Arrest of Disease.

69. A section through the left hip-joint, from a case of morbus coxæ. The head of the femur and the acetabulum are denuded of cartilage, and the bone is superficially eroded. Dense fibrous adhesions everywhere unite the two surfaces of the bones, so that there is only very slight movement between them. The remainder of the bones presents no evidence of disease, nor is there any abscess.

From a child, æt. 8. The disease of the hip had existed for a period of four and a half years, and it was considered to be nearly cured. Death

resulted from general tuberculosis. No suppuration had at any time existed in connection with the hip disease. A section of the spine showing angular curvature is preserved in Series V, No. 1103A.

St. Bart.'s Hosp. Museum, 627A.

70. One half of the upper part of a right femur which has been sawn through longitudinally. The great trochanter is hollowed out, and contains in its centre an oval sequestrum, measuring more than an inch in its long diameter; it is covered with soft granulations, and the cavity where it lies is lined by the same material. A small sinus led down from the top of the trochanter to the sequestrum. There is another abscess cavity filled by curdy pus in the lower part of the neck.

From a patient æt. 50. Forty years previously she had been under the care of Sir William Lawrence for disease of the hip-joint. See 'Female Surgical Register,' vol. ii (1889), No. 2586.*

St. Bart.'s Hosp. Museum, 210A.

71. Section of a hip presenting complete bony ankylosis of the ilium and femur. The patient, Cornelius L., æt. 17, had some few years before his death suffered from scrofulous disease of the hip. He died of phthisis and scrofulous disease of the kidney and bladder. The kidney is preserved in a subsequent series. 'Post-mortem and Case-book,' 1841, p. 47.

St. George's Hosp. Museum, Series III, 28B.

Effects of Tuberculosis of Hip-joint.

72. A hip-joint, in which acute disease had been several months in progress, from a boy 10 years old. The head of the femur is displaced towards the dorsum of the ilium. Ulceration of the capsule had taken place, and the head of the bone was contained in a cavity formed by the remains of the capsule, and by the surrounding muscles. Within this cavity, as well as in the acetabulum, was a mixture of a large quantity of pus and caseous matter. The section of the head of the femur shows caseous matter deposited in its cancellous texture. There is also a collection of caseous matter in the walls of the acetabulum, communicating with its cavity, and with the cavity of the pelvis. An abscess had formed between the periosteum and the shaft of the bone just below the trochanter. The sciatic nerve is seen upon the tuberosity of the ischium, near the dislocated head of the bone.

St. Bart.'s Hosp. Museum, 627.

73. The os innominatum and femur taken from a patient in the Hospital who died of phthisis at the age of eighty-two. He had suffered from disease of the hip-joint for some years, and dislocation of the femur from the acetabulum had been the consequence. The neck of the femur is seen

resting upon the margin of the cotyloid cavity, the head and part of the neck having been absorbed. There are several openings in the acetabulum, one of very large size leading into the pelvis ; these communicated with the joint. The whole of these parts were filled up by a ligamentous structure, which allowed some motion to take place, and enabled the patient to make use of the limb. Post-mortem and Case-book, 1851, p. 128.

St. George's Hosp. Museum, Series III, 14H.

74. Extensive caries of the ilium from disease of the hip-joint. Caries would appear to have commenced in the acetabulum, which is perforated by a large irregular cavity ; the bone around is worm-eaten and porous.

St. George's Hosp. Museum, Series III, 14J.

75. The right half of the pelvis, hip-joint, and pelvic organs from a long-standing hip disease. The specimen has been partially macerated, and the muscles removed from the bones. As a result of inflammation, the periosteum of the femur and ilium separated with great readiness. To a large extent the neck of the femur has disappeared. The femur itself has been partially dislocated on to the dorsum ilii, and has become ankylosed in that position. Suppuration extended round the joint in various directions, both inside and outside the pelvis, as shown by several smooth-lined abscess cavities. One sinus led through the great sciatic notch into the rectum, through which a black india-rubber tube has been passed.

From a child *æt.* 11, who had suffered from disease of the hip for a lengthened period. Four months before death a pelvic abscess formed, and three months later two large sequestra were removed by operation from the region of the acetabulum. She partially recovered from this, but at length died, two and a half years after the commencement of the disease, from exhaustion caused by prolonged suppuration. Presented by James Berry, Esq.

St. Bart.'s Hosp. Museum, 625A.

76. The right hip-joint, with the bladder and right kidney, from a patient who had a sinus extending from the acetabulum into the bladder. The head and neck of the femur have completely disappeared, as the result of long-standing disease of the hip. A fistulous track (through which a piece of catheter has been passed) traverses the base of the acetabulum, and communicates by a large aperture with the right side of the thickened and inflamed bladder. The right ureter is greatly dilated and thickened at its upper part ; it opens into the bladder after passing for some distance through the dense fibrous tissue which renders the side of the bladder adherent to the inner wall of the pelvis. The kidney is in an advanced condition of pyonephrosis, but has retained its normal size. During life fragments of bone passed through the fistula into the bladder.

From a man *æt.* 27, who had a phosphatic stone in his bladder, which had formed round fragments of bone. The bone had obtained access to the

bladder from the hip-joint by a fistulous passage, the result of long-standing hip-disease connecting the acetabulum with the bladder. The fragments of bone were removed by lithotrixy. See 'Male Surgical Register,' vol. v (1887), Nos. 1481 and 3674.

St. Bart.'s Hosp. Museum, 624c.

KNEE-JOINT.

77. This preparation has been injected. The cavity of the synovial membrane was distended by a large quantity of scrofulous matter; several pouches containing scrofulous matter were formed, both in the synovial membrane and on its external surface. The internal surface of these different cavities may still be seen lined by a thick layer of concrete pus. The cartilages are partly absorbed, and partly covered by a false membrane, in which may be traced the ramifications of some small arteries. The femur is softer and more vascular than natural; in several places scrofulous matter has been deposited in the cancellous structure. The parts external to the joints are thickened and very vascular. The bones of the tarsus and of the ankle-joint were also extensively affected with scrofulous disease. The disease had existed two years; the patient attributed the commencement of it to rheumatism. The thigh was amputated; the patient died of pneumothorax, the result of vomicae and tubercles. 'Post-mortem and Case-book,' 1842, p. 88.

St. George's Hosp. Museum, Series iii, 11A.

78. Section of the right knee-joint of a child injected. The articular cartilages are removed, to a great extent, by ulceration extending from the diseased bone beneath them, and the epiphysis of the femur has a carious excavation immediately under the cartilage. A large abscess in the soft parts around the joint is partially exposed externally by the removal of part of the integuments. Presented by John Hilton, Esq.

R.C.S. Museum, 642.

79. A knee-joint exhibiting well-marked pulpy degeneration of the synovial membrane. The cartilages of both the femur and patella are ulcerated. Microscopically the thickened synovial membrane contained abundant deposits of miliary tubercle, though no tubercle bacilli could be detected.

St. Bart.'s Hosp. Museum, 569B.

80. A knee-joint exhibiting tuberculous synovitis (pulpy degeneration). Nearly the whole of the articular surfaces are overgrown by the thickened synovial membrane. The articular cartilages everywhere appear healthy, and no morbid change is visible in the bones.

From a man æt. 34, whose left knee became swollen and painful two years before the amputation was performed. See 'Male Surgical Register,' vol. iii, (1887), No. 631.

St. Bart.'s Hosp. Museum, 569C.

81. A knee-joint removed by operation from a man æt. 52, which has been laid open. It is affected by tuberculous disease; the synovial membrane is "pulpy," the cartilage has disappeared in places, and the bone has been in part destroyed by caries. All these changes are well shown. The joint when opened also contained pus. See 'Male Surgical Register,' vol. v, 1893, 3280.

St. Bart.'s Hosp. Museum, 569c¹.

82. Section of a knee-joint injected, affected with strumous disease. The synovial membrane is unnaturally vascular, its inner surface was covered with shreds of lymph, and its cavity was distended with fluid. The cartilage covering the condyles of the femur is easily separated from the bone, and traces of erosion are observable, both superficial and extending from the deeper surface of the cartilage externally. The bones are injected.

From a child whose limb was amputated at the hip, for disease of that joint.

St. Bart.'s Hosp. Museum, 579A.

83. Five loose bodies from a knee-joint, together with part of the condyles of the femur, to which two similar bodies are still attached. When the incision was made into the joint for its excision on account of long-standing tuberculous disease, these five bodies were found loose in its cavity. While fresh they looked like, and had the consistence of, fat; after hardening in spirit one of them was incised, and is now seen to consist of an outer layer or shell enclosing a nucleus of different appearance. The microscope showed the nucleus to consist of partly degenerated hypertrophied synovial fringes containing tuberculous "giant-cells," the outer layer being granular, and doubtless formed of coagulated lymph. In support of this view is the fact that two similar bodies are still attached to the femur.

The patient was a girl æt. 10, who had suffered from tuberculous disease of the left knee-joint for three years, for the cure of which excision was performed. See 'Female Surgical Register,' vol. i (1890), No. 2104.

St. Bart.'s Hosp. Museum, 712D.

Abscess Cavity (Tuberculous) in Diaphysis of Bone.

- 84 A section through the lower end of the left femur, with a portion of the knee-joint. Occupying the centre of the widened diaphysis is an oval abscess-cavity, three inches in length, and an inch and a half across, which in the recent state communicated by a narrow aperture with the front of the knee-joint. It is lined with a pyogenic membrane, and the surrounding bony tissue is much thickened and sclerosed. Between this cavity and the epiphysial cartilage there is a second abscess, an inch in diameter, into which projects a partially detached sequestrum, indicated

by bristles. The reverse of the specimen shows that the synovial membrane of the knee-joint is much swollen, forming thick folds around the unaltered articular cartilages.

From a boy æt. 17, whose illness began with a painful swelling of the left knee three years before admission. Latterly the swelling had much increased, and the patient had lost flesh. Amputation through the middle of the thigh was performed, and the patient made a good recovery. In the recent state the cavity in the shaft of the femur was filled with caseous pus, in which numerous tubercle bacilli were found. Presented by Guy's Hospital, 1891.

R.C.S. Museum, 1247E.

Ligamentous Ankylosis.

85. Section of a knee-joint in a young subject in which ligamentous ankylosis has taken place. The patella is affected with necrosis, accompanied with tuberculous deposit; there is an external opening. Amputated by Dr. Kay in 1831.

Guy's Hosp. Museum, 1210⁸⁰.

Enlargement of Bursæ with Tuberculous Synovitis.

86. The lower third of the right thigh and the upper portion of the right leg, exhibiting a general enlargement of the bursæ in the neighbourhood of the knee. An irregular cystic swelling, which contained serous fluid, in which floated a large number of melon-seed bodies, lies upon the inner side of the joint, occupying in part the position of the bursa, between the semi-membranosus and semi-tendinosus tendons. The cyst is lined throughout by a thin membrane, which forms its wall. It is irregularly hour-glass in shape, the two swellings lying opposite the inner condyle of the femur, and the upper and inner part of the calf respectively, the constriction between the two parts being apparently due to the passage across the cyst of the sartorius and gracilis tendons. Immediately beneath the inner hamstring tendons, the constricted portion of the cyst opens by a tortuous passage into a second dilation, situated immediately beneath the popliteal vessels and nerve, in close contact with, but not opening into the bursa, which lies under the inner head of the gastrocnemius. From this point the cyst can be traced beneath the gastrocnemius muscle, where it dilates into a terminal sac. The popliteus muscle is greatly stretched and thinned, owing to the dilation of the bursa beneath it. This dilated bursa is separated from the one previously described by the popliteus muscle, and it does not appear that the two in any way communicate. Neither of the cysts communicate with the knee-joint.

The knee is almost typically affected with tuberculous synovitis. The cartilages everywhere appear to be healthy, except for some slight roughening over the external condyle and the corresponding articular surface of the patella. There are neither osteophytes nor ecchondroses. The ligaments, however, are much frayed and softened, so that they are

easily torn. The semilunar cartilages are in part worn away. The synovial membrane is remarkably affected, for from the neighbourhood of the mucosum et ligamenta alaria protrude large, soft, flattened and leaf-like synovial fringes. Some of the processes measure as much as one inch or one and a half inches in diameter. Microscopic examination shows that these fringes are the result of tuberculous inflammation, and that they contain masses of tubercle, and in some cases even the tubercle bacilli.

From a man *æt.* 41, a valet by occupation, who died of general tuberculosis Ten months before his death he observed a swelling on the inner side of his right knee. The swelling was said to have attained its maximum size in two or three days, and the patient was certain that it was not the result of an injury. The cyst was aspirated on two occasions, and synovial fluid with flakes of mucus in it was removed. See 'Male Surgical Register,' vol. ii (1886), Nos. 449, 1353, 2021, and 2868.

St. Bart.'s Hosp. Museum, 1205F.

ANKLE AND FOOT.

87. The lower end of a tibia removed from a girl *æt.* 17. A cavity in the cancellous tissue just above the articular extremity is filled by a deposit of caseous material. The ankle-joint was destroyed. Disease had existed in the leg and foot for fourteen years.

St. Bart.'s Hosp. Museum, 579.

88. Section of a foot from a young patient in the Hospital whose leg was amputated June 26th, 1826. The bones are affected with scrofulous disease, and were so soft that this section was made with a common scalpel. The cartilages between the os calcis and astragalus are in a state of ulceration; and there are abscesses opening externally, and communicating with the ankle-joint. Presented by Sir B. C. Brodie, Bart.

St. George's Hosp. Museum, Series III, 20A.

TUBERCULOSIS OF THE PERICARDIUM, HEART, AND BLOOD-VESSELS.

Tuberculous Pericarditis.

89. The pericardium was adherent; the adhesions, however, were everywhere broken down. There is general pericarditis. The upper part of the parietal layer of the pericardium on its anterior aspect is studded with miliary tubercles. The entire surface of the heart is covered with a thick layer of fibrin, in which miliary tubercles are scattered.

Microscopic examination of the fibrin revealed typical tubercle systems. The diaphragmatic and visceræal pleuræ on the left side were

studded with miliary tubercles, and there was some thickening of the pleura, with adhesions at the left apex. The lung substance itself was free from tubercle.

From the body of a man *æt.* 61, who died from carcinoma of the pylorus, with secondary growth in the liver.

St. George's Hosp. Museum.

90. The parietal layer is greatly thickened, containing tubercles with giant-cells and bacilli. There are no adhesions, and the sac wall filled with clear fluid. From a child *æt.* 9 months, who died of general tuberculosis.

St. George's Hosp. Museum, Series VI, 4 *b*.

91. A heart to which the pericardium is universally adherent. The heart is enlarged, and weighs seventeen ounces with its covering. In front the pericardium has been incised and partially detached; on its inner surface and on the surface of the heart numerous tubercles can still be seen imbedded in the coagulated fibrin. They are now much less distinct than when the specimens were fresh. Examination of the interior of the heart showed that the valves were normal and unaffected.

The patient was a sailor boy, *æt.* 16. He was admitted into hospital only three weeks before his death. During his illness he never complained of any pain, and with the exception of a markedly hectic temperature, did not seem ill. Coma, probably due to tuberculous meningitis, set in the day before his death. At the post-mortem examination his lungs, liver, and spleen were all the seat of recent tuberculous inflammation.

St. Bart.'s Hosp. Museum, 1231a.

Tuberculosis of Pulmonary Artery.

92. A portion of lung from a case of tuberculosis, with the pulmonary artery and its primary branches laid open, showing in four divisions of the vessel clusters of minute granulations which are surrounded by, and more or less adherent to, enlarged and indurated caseous bronchial glands.

Case of J. M., *æt.* 14, who had tuberculous disease of the mesenteric, retro-peritoneal, mediastinal, and bronchial glands, with extensive tuberculosis of the peritoneum and ulceration of the ileum. There was fibrous induration and excavation of the apices of the lungs, and masses of caseous consolidation, clustered grey granulations, and isolated miliary tubercles throughout the organs, together with tubercles on the pleuræ. There were a few miliary tubercles in the liver, spleen, and kidneys. See 'Path. Soc. Trans.,' vol. xxxvii, p. 139.

London Hosp. Museum, 1513.

93. A heart with the arch of the aorta, showing a deposit of tubercle in the visceral layer of the pericardium. The tubercles are most numerous upon the intra-pericardial portions of the aorta and pulmonary artery, and along the course of the branches of the left coronary vessels. The lymphatic glands situated behind the aorta are much enlarged, and

the substance is infiltrated with caseous material. From a boy æt. 3, who died of tuberculous peritonitis. Grey and caseous tubercles were found at the autopsy in the lungs, serous membranes, and abdominal viscera.

R. C. S. Museum, 2930*b*.

TUBERCULOSIS OF THE ORGANS OF RESPIRATION.

NOSE.

Tubercle of the Septum Nasi.

94. A small growth removed by operation from the septum nasi of a girl æt. 10, which microscopically proved to be tuberculous (*lupus nasi*). She had had suppurating tuberculous glands in the neck, and seven years before admission the nose became swollen, and a polypus was removed. On admission respiration through the right nostril was difficult; there was a yellow discharge, and on the septum a mass of granulations. (See 'Histological Records,' xii, 1763*B*, and 'Female Surgical Register,' vol. iv. (1897), No. 568.)

St. Bart.'s Hosp. Museum, 1763*B*.

LARYNX.

Lesions produced by Tuberculosis.

95. A larynx and part of the trachea, with a pyriform swelling of the arytæno-epiglottidean folds, and ulceration exposing the arytænoid and cricoid cartilages. The epiglottis is thickened, and its posterior surface is dotted with tubercles and small ulcers. The vocal cords and trachea are thickly beset with ulcers.

William D., æt. 31, was admitted under Dr. Goodhart. Three years before admission he had inflammation of the lungs and pleurisy. Soreness of the throat had existed for three months. He died of phthisis, with ulceration of the intestines. See 'Insp.,' 1887, No. 166.

Guy's Hosp. Museum, 52.

96. The epiglottis, larynx, and trachea laid open from behind, natural vascularity preserved, showing very extensive tuberculous lesions and ulceration. The mucosa of trachea and bronchi is acutely inflamed, and shows at various parts irregular ulceration with exposure in some places of the subjacent cartilages. The ulceration is deepest just below the right half of the glottis, and from there down the trachea for a distance of over three inches. The cervical glands lying external to this area are greatly swollen, enlarged, and pigmented. The vocal cords

present a characteristic greyish sodden appearance with ulceration at their posterior extremities. B. L., æt. 33—Dr. Green. Post-mortem, 2336. Admitted February 10th, 1900; died February 11th, 1900.

Charing Cross Hosp. Museum, 634c.

Pachydermia Laryngis (for comparison).

97. A larynx and adjacent parts, laid open from behind. The mucous membrane over the epiglottis and the aryæno-epiglottidean folds is swollen and rugose. There is considerable thickening over the true vocal cords.

From a man who died of chronic inflammatory disease of the lung without evidence of tubercle. Presented by Dr. Goodhart, 1876.

R.C.S. Museum, 3473.

Syphilitic Laryngitis (for comparison).

98. A larynx and upper part of the trachea opened from behind. The incision through the cricoid cartilage shows it to be surrounded by a gummatous material, which on the left side has separated the perichondrium. The mucous membrane covering the cricoid cartilage is ulcerated. In front there is an opening left after tracheotomy. The portions of lung and liver mounted behind show small gummata.

Eliza B., æt. 47, was admitted under Mr. Hilton, having suffered from hoarseness for five weeks, and from urgent dyspnoea for a few days. Tracheotomy was performed, and the patient was able to breathe without a tube. She died with cerebral symptoms a few days later. At the autopsy there were found gummata of the lung and liver, and softening of the brain. See 'Insp.,' 1866, No. 281; and 'Guy's Hosp. Reps.,' 1867, p. 357.

Guy's Hosp. Museum, 46.

99. Normal larynx for comparison.

Tuberculosis of Larynx.

100. A larynx with a portion of the pharynx and tongue mounted to show extensive ulceration of the interior of the larynx above the vocal cords, which has in great part destroyed the aryæno-epiglottidean folds. On the left wall of the pharynx there is a patch of more superficial ulceration.

John D., æt. 12 months, was admitted under Dr. Taylor for dyspnoea and a cough of two days' duration, with the physical signs of broncho-pneumonia. He died six days after admission, and at the autopsy there were numerous hepatised patches in both lungs, and recent lymph upon the pleura. See 'Insp.,' 1890, No. 167.

Guy's Hosp. Museum, 28.

101. The larynx from a patient who died of tuberculous phthisis. The larynx presents the appearance seen in early cases of laryngeal tuberculosis, viz. some tumefaction and slight thickening of the mucous membrane.

St. Bart.'s Hosp. Museum, 1631A.

102. The larynx of a child, showing very early tuberculous ulceration of the inter-arytænoid fold.

St. Bart.'s Hosp. Museum, 1631B.

103. The larynx and trachea from a case of phthisis. The posterior end of the right vocal cord is destroyed by tuberculous ulceration. The mucous membrane covering the posterior portion of the trachea is deeply and extensively ulcerated, the ulceration extending into the left bronchus.

From a girl æt. 18, who, after acute pneumonia, had chronic pulmonary phthisis. See 'Elizabeth Ward-book' for 1887, No. 14.

St. Bart.'s Hosp. Museum, 1631H.

104. The larynx and trachea from a case of pulmonary tuberculosis. A deep ulcer is situated over the posterior end of the left cord. Superficial ulcers are scattered over the mucous membrane of the trachea and larynx, and are due to infection by sputum. The uvula is bifid.

Lent by Dr. Jobson Horne.

105. The larynx from a case of tuberculous phthisis; the whole mucous membrane is in a condition of diffuse superficial ulceration.

St. Bart.'s Hosp. Museum, 1631C.

106. The larynx from a patient who died of tuberculous phthisis; the whole mucous membrane is the seat of a process of diffuse ulceration.

St. Bart.'s Hosp. Museum, 1631D.

107. The larynx and a portion of the trachea from a patient who died with tuberculous phthisis. The epiglottis is thickened by a tuberculous inflammation, and has undergone some amount of ulceration at its apex. The right vocal cord is ulcerated, and there is a deep circumscribed ulcer in the subglottic portion of the larynx. Presented by Percy Kidd, M.D.

St. Bart.'s Hosp. Museum, 1631E.

108. The larynx from a case of tuberculous phthisis. The mucous membrane above the vocal cords is swollen, irregular, and ragged-looking, as if the mucous and submucous tissues were much thickened by inflammatory matter. Numerous yellow points and small ulcers may also be seen. Below the vocal cords the mucous membrane of the trachea is also superficially ulcerated, looking flocculent over the greater part of its surface.

From a man æt. 23, who died of laryngeal tuberculosis, and who also had congenital contraction of the orifice of the pulmonary artery. He suffered at first from hoarseness, and latterly from entire aphonia. The symptoms extended over five years. The lungs were tuberculous, and contained cavities. He died with symptoms of cerebral disease. The brain was much congested and the membranes opaque, but there was no appearance of tubercle. Presented by Dr. Peacock, 1876.

R.C.S. Museum, 3483.

109. A larynx, the mucous membrane of which is affected with follicular ulceration. There are numerous small ulcers covering the whole of the mucous membrane of the larynx from the epiglottis, which is also affected, to the upper margin of the trachea. The ulcers are so small and so numerous, and there is so much swelling of the mucous and submucous tissues, that the appearance is one rather of mammillation than of ulceration.

The patient, a man æt. 53, died with cavities in his lungs nine months after the commencement of laryngeal disease. The case is described and figured in the Jacksonian Prize Essay for 1863. 'MS. Appendix,' Case 51, and drawings, table ii, fig. 19. Presented by Dr. Morell Mackenzie, 1863.

R.C.S. Museum, 3481.

110. A larynx showing the effects of tuberculous disease. The mucous membrane is generally roughened and papillated, much increased in thickness, and completely hides the vocal cords, which appear to be buried in its folds. The epiglottis and the aryæno-epiglottidean folds share in the general thickening. There appears to be a very superficial ulceration in various parts, most marked at the upper end of the trachea.

The patient was a young man who died with general tuberculosis. He had suffered from aphonia for some time before his death.

St. Bart.'s Hosp. Museum, 1632A.

111. A larynx and trachea from a patient who died of tuberculous phthisis. The rima glottidis is much narrowed by the swollen and œdematous condition of the aryæno-epiglottidean folds, the mucous membrane of which, however, is not ulcerated. The under surface of the epiglottis and the mucous membrane lining the larynx and trachea is extremely roughened and granular.

St. Bart.'s Hosp. Museum, 1633B.

112. A larynx showing the effects of laryngeal phthisis. There is great thickening of the mucous and submucous tissues, and a large amount of deposit has taken place between the inner surface of the alæ of the thyroid cartilage and the mucous membrane covering the true and false vocal cords. Both the ventricles are completely obliterated. The deposit in the tissues over the arytenoid cartilages has formed two large roundish tumours. The false cord on the left side is smooth, indurated and prominent; the true cord on the same side is thickened; on the right side the false cord is irregularly ulcerated and projecting; the true cord is effaced by interstitial deposit. There is also much ulceration in several parts.

From a man æt. 35, who had aphonia and laryngeal pain for the last four years of his life. The lung-disease was not very marked. He died with exhaustion from diarrhœa. ('Jacksonian Prize Essay,' 1863, MS. vol. i, p. 68.) Presented by Dr. Morell Mackenzie, 1863.

R.C.S. Museum, 3478.

113. A larynx and upper part of the trachea. The epiglottis is thickened and recurved so that its upper border is continuous with the thickened aryæno-epiglottidean folds. The interior of the larynx is extensively ulcerated, and a deep excavation in the middle line above the vocal cords exposes a necrosed portion of the thyroid cartilage.

John A., æt. 32, was admitted under Dr. Wilks with evident signs of phthisis and dysphagia. There had been sore throat and hoarseness for eighteen months. See 'Insp.,' 1879, No. 377.

Guy's Hosp. Museum, 54.

114. A larynx with part of the trachea, from a man in whom tracheotomy was performed two days before death. Upon the epiglottis, the aryænoïd cartilages, and the chordæ vocales, the mucous membrane is thickened, ulcerated, and granular. Within the trachea, and especially upon its posterior wall, there is an almost continuous ulceration, which in some parts is superficial, in others extends deeply, and which at one point has formed an irregular opening through the walls of the trachea.

The patient died with phthisis. Tracheotomy was rendered necessary by imminent danger of suffocation; and the signs of the disease of the larynx had nearly concealed those of the disease of the lungs. The case is related by Sir George Burrows, Bart., in the 'London Medical Gazette,' vol. xxi, p. 50, London, 1837.

St. Bart.'s Hosp. Museum, 1632.

115. Chronic tuberculous laryngitis. Great thickening over the aryænoïd cartilages. The mucous membrane of the right ventricle is everted, and hangs like a polypus into the cavity of the larynx. Epiglottis normal. Tracheotomy was rendered necessary by the narrowing due to cicatricial contraction six months before death. There is ulceration along the track of the tube. Microscopically giant-cells and fibrous tissue, but no tubercle bacilli found. From a man æt. 53; there was an old fibroid phthisis.

St. George's Hosp. Museum, Series VII, 15, 1.

116. A larynx with the upper part of the epiglottis wanting, showing extreme tuberculous disease of the whole of the mucous membrane. The surface is irregular and rugose from swelling and thickening of the mucous and submucous textures, and is pitted over with numerous small irregular ulcers. The mucous membrane of the trachea is also finely honeycombed by ulceration.

R.C.S. Museum, 3484.

117. The specimen shows extensive ulceration of both ventricular bands. On the left side, arising from the centre of the ulcerated patch, is seen a large irregular globular mass, firm but ulcerated at its upper part. It is of the size of a small nut, and projects backwards. Both arytenoids are slightly swollen. The vocal cords are healthy.

From a female patient æt. 41, who died from chronic pulmonary tuberculosis with tuberculous ulceration of the larynx and intestines.

Brompton Hosp. Museum, B 37.

118. The glottis of a patient who died with tuberculous phthisis. The whole cavity of the larynx is ulcerated, the ulceration being deeper on the left side. The vocal cords are destroyed.

St. Bart.'s Hosp. Museum, 1633E.

119. A larynx showing the effects of tuberculous laryngitis. A large ulcer occupies the posterior attachment of each vocal cord, excavating deeply in front of each arytenoid cartilage. There is also extensive follicular ulceration of the mucous membrane over the epiglottis and trachea. From a patient who died of tuberculous phthisis. Presented by Dr. Goodhart, 1875.

R.C.S. Museum, 3482.

120. The specimen shows extensive tuberculous infiltration and ulceration of the larynx. The left arytenoid region is represented by a pyriform swelling. The right ary-epiglottidean fold is deeply ulcerated and thickened, while owing to extensive ulceration of the interarytenoid fold and adjacent parts the necrotic arytenoid cartilages are exposed. There is also a deep ulcerated pit leading to a semilunar excavation over the top of the cricoid cartilage.

From a male patient, æt. 38, who died from chronic pulmonary tuberculosis (total excavation of the left lung), arterio-sclerosis, and heart failure.

Brompton Hosp. Museum, B. 36.

Longitudinal Splitting of the Vocal Cord.

121. The specimen shows a very deep ulcer over the lower part of the epiglottis on the right side. Both cords are also ulcerated, and on the right side the cord has been partially split owing to the deep ulceration.

From a male patient, æt. 21, who died from chronic pulmonary tuberculosis with secondary tuberculous ulceration of the larynx and intestines, together with chronic tuberculous peritonitis.

Brompton Hosp. Museum, B. 5.

122. The specimen shows tuberculous ulceration of the larynx. A deep abscess is situated over the left vocal cord, and has caused ulcerative splitting of the anterior two-thirds of the same.

Brompton Hosp. Museum, B. 6.

123. The specimen shows diffuse tuberculous infiltration and ulceration of the organ. Below the level of the vocal cords (which have been entirely destroyed) is seen, on either side, an ulcerated ridge-like band. From a case of chronic pulmonary tuberculosis.

Brompton Hosp. Museum, B. 13.

124. The specimen shows diffuse tuberculous ulceration of the larynx, extending to the subglottic region. The ulcerated remains of the vocal cords can be seen to be displaced somewhat downwards. From a case of chronic pulmonary tuberculosis.

Brompton Hosp. Museum, B. 14.

125. A larynx with a portion of the tongue and of the trachea, from a patient, æt. 20, who died of tubercular phthisis. The whole of the supra-glottic portion of the larynx has undergone ulceration, especially upon the left side. The left greater cornu of the hyoid is necrosed, and the epiglottis is completely destroyed. (See 'Matthew Ward Book' for 1885, No. 1304.)

St. Bart.'s Hosp. Museum 1636A.

126. Chronic tuberculosis of larynx, trachea, and bronchi, producing much constriction. From a boy æt. 14. 'Post-mortem Book, 1887, No. 130.

St. George's Hosp. Museum, Series VII, 13B.

127. A larynx with part of the trachea opened from the front. Behind the vocal cords are two deep excavations leading down to necrosed cricoid cartilage. The arytenoid cartilages have disappeared. There is also destruction of the anterior wall of the pharynx exposing dead cartilage.

William H., æt. 64, was admitted under Dr. Moxon for aphonia, sore throat and slight hæmoptysis of twelve months' duration. He died of chronic phthisis and recent broncho-pneumonia, tracheotomy having been performed one week before death. See 'Insp.,' 1879, No. 8.

Guy's Hosp. Museum, 56.

Tuberculous Laryngitis. History of Venereal Disease.

128. A larynx and part of the trachea. There is partial destruction of the upper margin of the epiglottis with ulceration of its under surface. The mucous membrane lining the interior of the larynx is ulcerated throughout. The blue rod indicates a perforation of the right sacculus laryngis.

Daniel McC., æt. 29, was admitted under Dr. Moxon for sore throat and hoarseness of two months' duration. About six months before death he had hæmoptysis and cough. There was a history of gonorrhœa and venereal sores nine years before. He died of phthisis. See 'Insp.,' 1874, No. 220.

Guy's Hosp. Museum, 53.

Papilloma of Larynx Complicating Chronic Pulmonary Tuberculosis.

129. The specimen shows a large sessile papilloma, the size of a small marble, growing from the left vocal cord; also, numerous similar warty granulations springing from other portions of the laryngeal mucous membrane,

and from the upper part of trachea (where the tracheotomy tube was in contact with tracheal wall). The tracheotomy wound is clearly seen.

From a boy æt. 3, who suffered from chronic pulmonary tuberculosis, and who was admitted for stenosis of larynx. Tracheotomy was performed. The patient quite recovered from the operation, but some time later was one morning found dead in bed. The tracheotomy tube was in its place, and clear. The cause of death was not obvious. Post mortem, the left lung showed tuberculous disease of upper and lower lobes partly old, and partly recent; the right lung was free from disease.

Brompton Hosp. Museum, 116.

Lupus of the Larynx and Fauces.

130. A larynx with the fauces and a part of the pharynx. The hard and soft palate, the back of the pharynx, and the larynx are extensively thickened and ulcerated. The uvula and part of the soft palate are destroyed.

Mary W., æt. 41, was admitted under Mr. Bryant. The lupus began upon the cheek thirteen years before the patient's death. It had affected the mucous membrane of the mouth for more than six years. The last operation of scraping the ulcerated surface was performed ten days before death, which resulted from chronic phthisis with miliary tuberculosis of the lungs. See 'Insp.,' 1883, No. 239.

Guy's Hosp. Museum, 57.

Tuberculous Ulceration of the Larynx in a Leper.

131. A larynx showing severe ulceration of its interior surface with complete destruction of the vocal cords. The ulceration extends as high as the middle of the epiglottis, and in front exposes the anterior angle of the thyroid cartilage, the two halves of which have become separated.

James E., a negro, æt. 14, was admitted into the Trinidad Leper Asylum for severe laryngeal symptoms, which had first appeared a year before his admission. He died six months later from tuberculosis of the lungs. Bacilli found in the larynx were thought to be those of tuberculosis. See 'Note-book,' No. 3, p. 3. Presented by Dr. Beaven Rake.

Guy's Hosp. Museum, 61.

Leprous Ulceration of Larynx.

132. A larynx laid open, the epiglottis of which is thickened, distorted, and partially destroyed by ulceration. A similar condition of ulceration and thickening affects the aryæno-epiglottidean folds and the interior of the larynx. There is a large tracheotomy wound in front, and the mucous membrane of the trachea is covered with recent lymph.

Richard S., æt. 22, was admitted under Dr. Taylor with tubercular leprosy. The face was swollen and covered with dry scaly tubercles, the hands and feet were œdematous, and the limbs and trunk presented numerous ulcers. Tracheotomy was performed on account of urgent dyspnoea. The patient lived in India until he was six years old, the disease first appearing when he was fourteen. Post-mortem the specific bacillus was found in great number in the testes, larynx, skin, and ulnar nerve. See 'Insp.,' 1888, No. 278; and 'Trans. Path. Soc.,' vol. xl, p. 307.

Guy's Hosp. Museum, 58.

Leptous Ulceration of the Larynx.

133. A larynx and upper part of the trachea showing ulceration of the epiglottis, which is thickened and recurved. There are superficial ulcers below the arytaenoid cartilages. Presented by Dr. Beaven Rake.

Guy's Hosp. Museum, 59.

Stenosis of the Larynx from Leprosy.

134. A larynx and upper part of the trachea showing narrowing of the superior laryngeal aperture from thickening of the arytaeno-epiglottidean folds and the base of the epiglottis. The rest of the epiglottis has been destroyed by ulceration.

Joseph S., æt. 21, was an inmate of the Trinidad Leper Asylum from the age of nine years. At the time of his death he had been the subject of leprosy for fourteen years. There were ulcerated tubercles on the face, destruction of the nasal bones, and great distortion of the fingers. He died from chronic laryngeal obstruction. Numerous bacilli were found in the larynx and other organs. See 'Note-book,' No. 3, p. 7. Presented by Dr. Beaven Rake.

Guy's Hosp. Museum, 60.

Leprosy of Larynx.

135. Swelling and infiltration of the mucous membrane, especially over the epiglottis, superficial ulceration extending into the trachea. Presented by Dr. Beaven Rake.

St. George's Hosp. Museum, Series VII, 21A.

136. Great deformity due to cicatricial contraction. The epiglottis is destroyed, the arytaeno-epiglottidean folds very much thickened, and the glottis reduced to a chink. The specimen is a much later stage than 21A. Presented by Dr. Beaven Rake.

St. George's Hosp. Museum, Series VII, 21B.

TRACHEA AND GREAT BRONCHI.

Infection from Sputum.

137. The specimen shows numerous tubercles scattered throughout the trachea and great bronchi. Many of these show commencing superficial ulceration. The tubercles are, for the most part, in the lower half of the trachea. The upper half is almost unaffected. The mucous membrane in the neighbourhood of the tubercles is greatly inflamed and injected.

From a man, æt. 27, who suffered from chronic pulmonary tuberculosis. In addition to tuberculosis of trachea, there was commencing ulceration of the intestine, and also early signs of tuberculous laryngitis.

Brompton Hosp. Museum, 108.

138. The specimen shows extensive ulceration of the trachea and slight ulceration of the left bronchus, and of the larynx.

From a man æt. 38, who suffered from chronic pulmonary tuberculosis. Post-mortem, tuberculous disease of intestines was also found.

Brompton Hosp. Museum, 24.

139. Trachea showing extensive necrosis of cartilaginous rings; the mucous membrane of larynx was much thickened, but there was no actual ulceration. Both lungs were extremely infiltrated with tuberculous deposits in various stages.

The specimen was taken from a man æt. 31. There were no signs of syphilis.

Middlesex Hosp. Museum.

140. The larynx and a portion of the trachea from a man æt. 42, who died of tuberculous phthisis. The whole of the mucous membrane lining the trachea is occupied by numerous circular ulcers, which extend to a considerable depth. The supra-glottic portion of the larynx is free from ulceration. See 'Medical Post-mortem Book,' vol. xiii, p. 46.

St. Bart.'s Hosp. Museum, 1633F.

141. Larynx and trachea with the base of tongue, dissected so as to show the enlarged tracheal glands and the thyroid gland attached to the trachea and larynx. The specimen was obtained from a woman æt. 51, and it shows extensive tuberculous disease of the mucous membrane of the trachea, and a few tuberculous ulcers in the mucosa of the larynx below the vocal cords. The lymphatic glands are black with carbon particles and microscopically were tuberculous. There was also tuberculosis of the lungs, with tuberculous ulcers of the intestines, and a tuberculous tumour in the cerebellum, small miliary tubercles on the surface of the kidneys and peritoneum. (Fixed in formalin and preserved in glycerine. See 'Medical Post-mortem Register,' vol. xxiii (1896), p. 267; and 'Female Medical Register,' vol. ii (1896), No. 158.)

St. Bart.'s Hosp. Museum, 1633F¹.

Tuberculous Ulceration of the Larynx, Trachea, and Great Bronchi.

142. The specimen shows extensive ulceration of the larynx. The whole of the trachea is infiltrated and studded with ulcers. The majority of these are small and superficial, but one or two are of larger size, and extend more deeply. The main bronchi are also somewhat ulcerated.

From a male patient æt. 27, who died from chronic pulmonary tuberculosis, with tuberculous lesions of the intestines, larynx, trachea, and great bronchi.

Brompton Hosp. Museum, M. 205.

Ulceration of Enlarged Gland into Trachea.

143. The larynx and trachea of a child. Just above the bifurcation an enlarged lymphatic gland has become adherent to, and has ulcerated into, the trachea, causing death by suffocation.

The patient was a little girl æt. 4. She had been subject to attacks of spasmodic laryngitis. She was seized with a violent attack of dyspnœa, and died rapidly from asphyxia. Presented by Alexander Harper, M.D.

St. Bart.'s Hosp. Museum, 1633L.

144. The larynx and trachea of a child, with the mediastinal glands enlarged and caseous. One of them has ulcerated into the trachea above the bifurcation.

From a child æt. 2. It had been under treatment for a short time for laryngeal dyspnœa of a paroxysmal character, called "fits" by the mother. It was well nourished and healthy looking, and there were no physical signs indicative of disease, although the symptoms led to the supposition of some enlargement of the mediastinal glands. The child was suddenly seized with one of her attacks in the middle of the night, and died almost immediately. 'MS. Notes,' vol. iii, p. 24. Presented by Dr. Goodhart, 1877.

R.C.S. Museum, 2849.

Communication between Trachea and Œsophagus.

145. Communication between the trachea and œsophagus. There is an ulcer three and a half inches in its long diameter in the œsophagus opposite the bifurcation of the trachea. The cause of this communication appears to have been most likely a tuberculous gland at the bifurcation of the trachea. From a man æt. 22, who had had both testes removed for tubercle. There was no active tubercle in the lungs. 'Post-mortem Book,' 1889, No. 88.

St. George's Hosp. Museum, Series IX, 19B.

LUNGS.

Normal lung for comparison.

Acute Miliary Tuberculosis. Infection from Bronchial Glands.

146. A portion of the upper lobe of the lung of an infant æt. 9 months. It shows near the lower angle a few grey miliary tubercles (natural colours preserved). This portion of lung surface lay in contact with an inflamed and softened bronchial gland. The tuberculous disease in lung was confined to the parts in immediate contact with the softened bronchial glands, viz. to middle lobe, as above described; and to portion of upper lobe lying in contact with the caseous gland, where a few discrete miliary

tubercles were found. (See also 147, 148.) Mr. Boyd's cases, post-mortem 1838, June 3rd, 1897. (Forniol. glycerine.)

I. C., æt. 9 months, admitted for abscess behind ear, found on operation to be due to tuberculous disease of mastoid bone.

Charing Cross Hosp. Museum, 663.

147. Other half of lobe of preceding specimen showing similar changes.
Charing Cross Hosp. Museum, 663A.

148. One half of the lung of a child with a row of bronchial glands on its inner edge above the hilus. The glands are enlarged and caseous. The largest situated apparently within the lung substance, in reality in relation to the main bronchus has undergone partial softening, and the lung substance immediately adjacent to this softened gland is over a pyramidal area in a state of caseous pneumonia (tuberculous), and presents a pale yellow colour. The lung substance around presents its natural red colour, and is studded with small grey and caseous tuberculous nodules. The pleura is slightly inflamed, and covered with yellowish flaky lymph. Dr. Abercrombie's Cases, 1897.

Charing Cross Hosp. Museum, 664.

Ulcerative Phthisis (in an Infant). Infection from Bronchial Gland.

149. Portion of the middle lobe of the lung of an infant, the greater part forming an irregular cavity with inflamed and caseating walls. At the upper angle of the lobe, close to the main bronchus, there is an enlarged caseous and partially softened bronchial gland, with intensely inflamed, reddened, and thickened capsule. This capsule has ulcerated through at its lower part where it abuts on the lobe, and this probably proved the starting-point of the infection of this middle lobe. For the infection was exclusively limited to this lobe. The rest of the lungs was quite free from tubercle, with the exception of a limited area of the upper lobe of this same lung, which lay in contact with this same softened gland. This portion of lung showed a few grey miliary tubercle granulations. (See 146 and 147.)

Charing Cross Hosp. Museum, 666.

Miliary Tuberculosis.

150. The heart, lungs, trachea, and bronchial glands of a child æt. 16 months. Through all the substance of the lungs small grey miliary tubercles are thickly scattered. They have uneven outlines, but tend to the oval form; they measure from half a line to a line in diameter; some present small cavities at their centres. A few of them are in groups; around all, whether scattered or grouped, the pulmonary tissues appear healthy.

The bronchial glands are enlarged. The blood-vessels of the lungs are injected through the pulmonary artery.

The child's mother died of phthisis six days after its birth, and it was always sickly and emaciated.

R.C.S. Museum, 3375.

151. A similar specimen, not injected, and with fewer tubercles. Presented by Sir James Paget.

R.C.S. Museum, 3376.

152. Section of a lung, injected, in which miliary tubercles are very thickly scattered.

St. Bart.'s Hosp. Museum, 1715A.

153. A section of lung, showing a complete infiltration of the whole pulmonary tissue with miliary tubercle. The masses are better seen on that surface of the lung which was cut whilst the specimen was fresh, than on that which was made after hardening in spirit.

From a man æt. 37. There was no caseation or breaking-down of the pulmonary tissue. See 'Medical Post-mortem Register,' vol. xv, p. 24.

St. Bart.'s Hosp. Museum, 1717A.

154. Portions of a lung in which tuberculous matter has been deposited. In the upper portion there are numerous miliary tubercles, arranged for the most part in groups; in the lower there are several small irregular cavities, surrounded by similar tubercles, and by tuberculous matter diffusely infiltrated in the substance of the lung.

St. Bart.'s Hosp. Museum, 1718.

155. Right lung of a girl æt. 2, who died with acute miliary tuberculosis. The surface of the lung shows pleurisy at the base, and numerous tubercles under the pleura, especially at the base. The lung is evidently in a condition of broncho-pneumonia, and there is also a small caseous gland at the root of the lung (fixed in formalin and preserved in glycerine). (See 'Medical Post-mortem Register,' vol. xxiv, p. 70; and 'Female Medical Register,' vol. ii (1896), No. 43.

St. Bart.'s Hosp. Museum, 1718C³.

Chronic Pulmonary Tuberculosis with Terminal Miliary Tuberculosis of Lungs only.

156. The specimen shows the posterior half of both right and left lungs. A fairly recent cavity at the apex of left lung is visible. This was the only evidence of earlier disease in either lung. Apart from this, both lungs are found to be thickly studded with recent miliary tubercles. In the left lung these are so extremely numerous that only an indication of a

racemose arrangement can be made out. In the right lung this also is the case towards the base of the lung, but in the upper part the tubercles are aggregated together into definite racemose masses, which can be well seen in the specimen. The majority of the tubercles seem to be of very similar age.

From a man æt. 22, who suffered from chronic pulmonary tuberculosis and tuberculous ulceration of intestine. No miliary tubercles were found in any other organs after death except the lungs. It would therefore seem, bearing in mind also the indication of racemose arrangement in the right lung, that the miliary tubercles in this case were the result of an inhalation process, and *not* a blood infection.

Brompton Hosp. Museum, N. 208.

Chronic Pulmonary Tuberculosis with Terminal Miliary Tuberculosis of Lungs, Kidney and Liver.

157. The specimen shows the posterior part of right lower lobe. Innumerable miliary tubercles are present, many are exactly similar in appearance to those found in the kidney, and presumably, therefore, the great majority are due also to a blood infection, especially as but little racemose arrangement can be seen.

From a man æt. 21, who suffered from chronic pulmonary tuberculosis, with tuberculous ulceration of intestines. At the post-mortem tuberculous disease of older date was found at left apex, but with this exception the whole of both lungs were thickly studded with miliary tubercles similar to those seen in the specimen. Miliary tubercles were also found in the liver and kidney.

Brompton Hosp. Museum, N. 238.

Peribronchitis Caseosa-Tuberculosa Vesiculosa.

158. The lungs of a child, showing extensive tuberculous deposits and the condition described as the "honeycombed lung" (*Peribronchitis caseosa tuberculosa vesiculosa*). The right lung has not been incised, but the left lung has had half of each lobe removed to display the appearances presented on section. The right lung shows no adhesions between the lobes. The lobes are studded over with pale caseous areas of irregular and varying size. A large number of vesicles are seen just beneath the pleura. They vary in size from a pin's head to a pea (0.5—5 mm.), and are always found in relation to the caseous patches, and are not confined to the margins of the lobes. The left lung shows a similar condition externally. The cut surface shows an extensive honeycombed condition. The cavities vary in size, but are smooth-walled, and some, seen in the lower part of the upper lobe, show that the vesicles are not confined to the surface of the lung. There is no general dilatation of the bronchi, but the caseous areas show small apertures in their centre (*peribronchitis caseosa*). The lower lobes show a similar but less advanced condition. The bronchial glands at the tracheal bifurcation and above it are enlarged

and caseous. From a child æt. 5 months. Post-mortem, 205, 'Med. Reg.,' 1017, 1898.

Middlesex Hosp. Museum, 1298A.

Acute Pulmonary Tuberculosis, Broncho-Pneumonic Type.

- 159 This specimen shows a section through the right lung. The upper lobe shows two cavities near its outer wall. Three recent ones are also seen near the apex of the lower lobe. The remainder of the upper lobe, and the upper third of the lower lobe, are practically solidified by large caseating masses of tuberculous broncho-pneumonia. Some of these were commencing to soften. Scattered tubercles in a condition of caseation are also to be seen in the remainder of the lower lobe.

From a youth æt. 19, who was in perfect health until four and a half months before his death, when he "caught cold," and his illness began. His temperature in the hospital was markedly inverse. At the post-mortem the intestines also showed tuberculous ulceration, but the other organs were free from disease.

Brompton Hosp. Museum, 181.

Acute Caseous Pulmonary Tuberculosis, Broncho-Pneumonic Type.

160. The specimen shows the posterior part of the left lung. Large masses of caseating tuberculous broncho-pneumonia are seen. At the upper part of the lung these have united and are softening. Cavities have thus here already formed or are in process of formation. In the lower portion of the lung softening is only just commencing.

From a boy æt. 18, whose illness commenced suddenly through "getting wet through" one day, five months before death. Post-mortem, besides the disease of the lungs (the right lung was in a very similar, though not so advanced, a condition as the left), the lower dorsal and sacral vertebræ were carious, and a right psoas abscess was found. There was also phlebitis of the left external iliac vein. The patient never complained of pain in region of the abscess, and there was no clinical signs of it during life. Whether the vertebral caries existed before the commencement of the pulmonary disease, or whether the latter was primary, could not, therefore, be stated with certainty.

Brompton Hosp. Museum, 199.

Lung Showing recent Caseating Racemose Tubercle.

161. The specimen shows the posterior portion of the left lung. The upper lobe is seen to contain a large cavity. The lower lobe is very thickly studded with recent racemose tubercle, for the most part just commencing to caseate. These are most numerous in the upper part of the lobe, where they have practically solidified the lung tissue. At the base they are more discrete.

From a youth æt. 19, who suffered from chronic pulmonary tuberculosis with tuberculous ulceration of the intestines.

Brompton Hosp. Museum, 149.

Racemose Tubercle affecting Central Parts of Lung, leaving an Unaffected Shell of Lung Tissue externally.

162. The specimen shows a section through the right lung. Numerous recent racemose tubercles with pigmented centres and caseating circumferences are seen affecting the central portions of the upper and lower lobes. A shell of practically unaffected lung tissue, about two thirds of an inch thick, separates these from the pleural surface. The specimen is of interest clinically, since it explains how it is that extensive tuberculous disease of the lung may be present, and yet the physical signs be scanty or even absent.

From a man æt. 34, who suffered from chronic pulmonary tuberculosis and tuberculous ulceration of trachea, great bronchi, and intestines. In the left lung extensive excavation was also present. The larynx was unaffected.

Brompton Hosp. Museum, N. 212.

163. Acute pneumonic phthisis in lower lobe. Chronic tuberculosis in upper lobe.

Charing Cross Hosp. Museum, 665.

Ulcerative Phthisis.

164. A slice through an adult's lung extensively affected with tuberculous disease, and showing all the changes associated with advanced tuberculous disease. The lower part of the lobe is consolidated (tuberculous pneumonia), and studded with tubercle nodules varying in size and in every stage of caseation, a few of them softening. At the upper part is a large irregular cavity cut across with inflamed ulcerated walls, thick trabeculæ containing branches of the pulmonary vessels stretching across. Some of these vessels are cut across, and can be seen to be thrombosed. The pleura over the lung is chronically thickened and covered with recent flaky lymph (chronic and recent pleurisy). The mucosa of the bronchi is intensely congested. (Chronic bronchitis, 1898.)

Charing Cross Hosp. Museum, 666A.

Ulcerative Phthisis—Perforation of Pleura (Empyema).

165. A quadrilateral piece of lung, from the same case as preceding, showing extensive tuberculous changes (tuberculous pneumonia), caseating and pigmented tubercle nodules, and at one part an irregular cavity of considerable size. At one point the cavity has ulcerated through into the pleural cavity, a fistulous aperture being seen on the pleural surface. A rod of glass passed through this leads directly into the cavity in the substance of the lung. The pleura around is acutely inflamed, and around the opening there had formed a localised empyema.

Charing Cross Hosp. Museum, 666C.

Tuberculous Broncho-pneumonia, with early Cavities.

166. Section through the left lung of a child, showing tuberculous broncho-pneumonia with early cavities. The lung is completely solid except at the extreme base. Both lobes are affected, and almost equally so; at the apex the process is less advanced than lower down. There are caseous patches here and there which have begun to break down into irregular cavities.

From a child æt. 1 year and 8 months, who died of general tuberculosis, with tuberculous cerebral tumours. See 'Medical Post-mortem Register,' vol. xxiv (1897), p. 295; and 'Female Medical Register,' vol. iii (1897), No. 122.

St. Bart.'s Hosp. Museum, 1724E.

Cavities in Lung.

167. Portion of a lung exhibiting an extensive destruction of its substance consequent on the formation and progress of tubercle. The walls of the large cavity, which occupies the place of more than half the lung, are composed of the pulmonary tissue, indurated and infiltrated with tubercular matter; and are rendered very irregular by the projection of numerous large branches of the blood-vessels which have not been involved in the destruction of the adjacent parts. The pleura is thickened, and has soft false membrane on its surface.

St. Bart.'s Hosp. Museum, 1723.

Tuberculous Cavity involving the whole Lung.

168. Section through a right lung, showing almost complete excavation of all its lobes into one large tuberculous cavity. The visceral and parietal pleuræ are completely adherent, and form, with a thin shell of condensed lung-tissue, the wall of the cavity. At the base the amount of lung-tissue left is greater than elsewhere, and shows tuberculous and fibrous consolidation. The cavity is lined by a smooth membrane, and is crossed by a few blood-vessels. Indications of the original lobation of the lung are shown by septa projecting into the cavity.

From a girl æt. 16, who died of phthisis. The total duration of symptoms was about five years. The right side of the chest was dull on percussion, with amphoric breathing and bell-sound, but no succussion splash. There was contraction of the chest on the right, and some lateral curvature. The heart was displaced to the right of the sternum.

Post-mortem.—The cavity in the right lung showed hardly any secretion. The left lung showed compensatory emphysema, with a cavity at the apex as large as a cherry, and surrounding tuberculous consolidation; one or two smaller cavities were also present at the apex of the lower lobe. No other tuberculous lesions were found in the body. See 'Female Medical Register,' vol. v (1898), Nos. 38 and 146, and vol. v (1899), No. 1; and 'Medical Post-mortem Register,' vol. xxvi, p. 47.

St. Bart.'s Hosp. Museum, 1718E.

Caries and Necrosis of Bone in the Progress of Tuberculosis of Lung.

169. Scrofulous disease of the ribs connected with an abscess in the lung.

H. I., æt. 18, under Mr. Forster for scrofulous disease of various bones.
'Insp.,' 301, 1863.

Guy's Hosp. Museum, 1044²⁰.

170. The lower part of a sternum with the cartilages of some of the ribs, and the integuments covering them. In the progress of tuberculous disease a part of one of the lungs became adherent to the posterior surface of the sternum. A large cavity formed in this part of the lung, and as the ulceration extended, it destroyed both the layers of pleura and the false membrane by which they were united, produced partial necrosis and ulceration of the sternum, and at length opened through the integuments of the front of the chest from which the cavity continued for a long time to discharge. The preparation shows an irregular opening, with smoothly-rounded margins in the integuments, the diseased part of the sternum beneath it, and at the posterior part a portion of the tuberculous cavity.

The patient was a man æt. 40. There was also extensive ulceration of the larynx and trachea, and many portions of the cricoid cartilage perished after ossification, and were coughed up. There were several other cavities in the lungs.

R. C. S. Museum, 3400.

Emphysema and Tuberculosis of Lung.

171. A vertical section through a right lung and the diaphragm showing considerable thickening of the pleura, the layers of which are adherent over the upper part of the lung, while elsewhere they are separated by a narrow interval crossed by thin membranous bands. The thickened pleura shows upon its cut surface numerous small yellow points of caseation. The lung is emphysematous and thickly beset with miliary tubercles. There is a small cavity in the middle of the upper lobe.

Guy's Hosp. Museum, 365.

Chronic Pulmonary Tuberculosis with Secondary Bronchiectasis.

172. A portion of the lower lobe of the lung, showing exaggerated fibroid change in the pulmonary tissue. The lung is consolidated, its vessels being occupied by a soft caseous material; the bronchi are dilated, and their walls are thickened. The changes were much more marked in the lower than in the upper lobe, indicating a basis phthisis. Presented by Vincent Harris, M.D.

St. Bart's Hosp. Museum, 1679A.

173. The specimen shows an anterior half of right lung. The upper lobe shows old cavities with fibrosis, and in this lobe the bronchi are in a state of





Photograph of specimen 175.

Rupture of a pulmonary aneurism with fatal hæmoptysis.

From the Brompton Hospital Museum.

cylindrical bronchiectasis. In one situation also there is a small saccular dilatation. The middle lobe shows a cavity with fibrosis, and its bronchial tubes are somewhat dilated. The lower lobe shows a large old cavity near the apex, while the remainder of the lobe is thickly studded with recent grey miliary and racemose tubercles. The bronchi in this lobe, too, are somewhat larger than natural.

From a woman æt. 47, who, in addition to the disease of the lungs, showed also post-mortem tuberculous ulceration of intestine, and lardaceous disease of spleen, kidneys, and intestines.

Brompton Hosp. Museum, 152.

Pigmented Tubercle.

174. The specimen shows a section through the right lung. Numerous deeply pigmented tubercles are seen scattered throughout the upper lobe, and through the upper part of the lower lobe. The lung also contained three small cavities, two in the upper lobe, and one in the lower.

From a man æt. 43, who suffered from chronic pulmonary tuberculosis, with tuberculous ulceration of larynx and intestines. The left lung showed total excavation of upper lobe, and a large cavity in apex of lower lobe, and scattered throughout the latter much recent tubercle with surrounding pseudo-lobar broncho-pneumonia.

Brompton Hosp. Museum, 209.

Pulmonary Aneurism ; Rupture ; Fatal Hæmoptysis.

175. The specimen shows a vertical section through the left lung. This is seen to be somewhat shrunken, while the pleura is greatly thickened. The upper lobe is in a condition of almost total excavation, while a large cavity communicating with the former is also present in the lower lobe. On the anterior wall of this cavity is situated an aneurism the size of a small marble. This had ruptured at one spot, and as a result both cavities were found filled with recent blood-clot. (On the right hand side of the specimen this has been left *in situ*).

From a man æt. 20, a shop assistant, who was in the hospital suffering from chronic pulmonary tuberculosis, with a history of two years' duration. During the last week of his life he suffered on three occasions from hæmoptysis, bringing up seven, fourteen, and five ounces respectively. It may be added that in the right lung, which showed both old and recent tuberculous disease, a second aneurism was found very similar in size to the one here shown. It had not, however, ruptured.

Brompton Hosp. Museum, 223A.

Chronic Phthisis (with Hæmoptysis).

176. A half of a lung showing both chronic and recent tuberculous changes. The upper lobe is shrunken, and is represented by two or three large emphysematous-like bullæ with their transparent walls.

The lower lobe seems to be (compensatorily) enlarged, and shows at

its upper gle a cavity $3\frac{1}{2}$ cm. across, filled with recent red blood-clot, some blood being also seen in the larger bronchi. The lung tissue adjacent to this cavity shows a large number of grey miliary tubercles. The pleura is chronically thickened. From a patient who died suddenly from profuse hæmoptysis.

Charing Cross Hosp. Museum, 666E.

Hæmorrhage into a Tuberculous Cavity.

177. Section through the upper portion of the right lung, showing two large phthisical cavities. The apical cavity is empty, and lined with a smooth thick membrane. The lower one is completely filled by firm, laminated blood-clot. The whole upper lobe is consolidated, and miliary tubercles are seen elsewhere in the lung.

From a man æt. 31, who died of phthisis after an illness of three years' duration. Five weeks before his death he was admitted to the hospital for hæmoptysis of eighteen days' duration. The hæmorrhage gradually decreased, and was very slight at the time of his death. See 'Medical Post-mortem Register,' vol. xxiv (1897), p. 311; and 'Male Medical Register,' vol. v (1897), No. 200.

St. Bart.'s Hosp. Museum, 1725B.

178. The specimen shows an aneurism about the size of a horse chestnut, lying in a cavity of very considerable extent in the upper lobe of the right lung. This aneurism springs from a vessel emerging into the excavation. It is extensively ruptured, and blood-clot can be seen adherent to the walls. The lung tissue surrounding the cavity is in a fibroid condition, and has contracted.

From a man æt. 32, who suffered from chronic pulmonary tuberculosis, with lardaceous disease of liver, spleen, kidneys, and intestines.

Brompton Hosp. Museum, M. 229.

179. Vomica containing blood-clot. Case of fibrous tuberculosis. 'Post-mortem Book,' 1898, No. 247.

St. George's Hosp. Museum, Series VII, 85N.

180. Portion of the left lung from a case of phthisis in which death resulted from hæmoptysis. There was much excavation of the pulmonary substance. An aneurism of the pulmonary artery as big as a pea is seen in the large cavity. A small irregular rent is visible in the aneurism. A bristle has been passed into the diseased branch of the vessel.

St. Bart.'s Hosp. Museum, 1758D.

Lung showing the Appearances of Inhaled Blood.

181. The specimen shows a longitudinal section through the right lung. The lower lobe shows well the appearances due to inhaled blood.

From a woman æt. 37, who suffered from chronic pulmonary tuberculosis, and who died from hæmoptysis. No aneurysm could be found after death.

Brompton Hosp. Museum, 220.

Chronic Pulmonary Tuberculosis showing considerable Thickening of Pleura, and much Fibroid Change in the Lung Tissue.

182. The specimen shows a section through the right lung. The pleura covering the organ is considerably thickened. The interlobar septa appear as dense white strands almost of the consistence of cartilage, while similar strands of fibrous tissue intersect the whole lung, especially along the course of the bronchi within the intersections formed by these bands; the lung tissue is tough, pigmented, infiltrated with tubercle, and in a condition of pneumonic consolidation. Numerous small cavities are seen scattered throughout the lung, while in the neighbourhood of the large bronchi many calcareous nodules embedded in fibroid tissue are to be found.

From a female æt. 18, who died from chronic pulmonary tuberculosis with lardaceous disease of the kidneys, liver, spleen, and intestines.

Brompton Hosp. Museum, G 21.

183. The specimen shows the upper lobe of the left lung. It is seen to be composed for the most part of pigmented fibroid tissue arranged almost concentrically around one or two small cavities and cretaceous masses. A few deeply pigmented fibroid tubercles are also seen. Old tuberculous disease with fibrosis was also found in the apex of the lower lobe, and in the right upper lobe.

From a female patient æt. 54, who had suffered for some considerable time from chronic pulmonary tuberculosis. Death resulted at the last from a terminal miliary tuberculosis of the lungs.

Brompton Hosp. Museum, G 24.

184. The specimen shows the apex of the right lung. Several small contracted cavities are seen, and the surrounding lung tissue is considerably fibrosed. The pleura covering the lung is greatly thickened, and at the very apex has attained a thickness of nearly three quarters of an inch.

From a male patient æt. 43, who suffered from chronic pulmonary tuberculosis of a very chronic type.

Brompton Hosp. Museum, G 26.

Arrest of Tuberculosis; Calcareous Deposits in the Lung.

185. Portion of a lung in which a large mass of calcareous substance is deposited immediately beneath the pleura, probably in the place where there was a tuberculous cavity. The surface of the lung is puckered in, like a cicatrix, over the deposit; and a thin layer around it is condensed and closely applied upon it. Black matter is abundantly deposited in spots through the lung, and especially around and near the calcareous substance. From the Museum of George Langstaff, Esq.

R.C.S. Museum, 3403.

186. Specimen, consisting of a portion of lung containing several small accumulations of scrofulous deposit, and also a large irregularly rounded mass, formed by aggregations of smaller portions of calcareous matter, the remains of dried-up scrofulous matter. A puckering or cicatrix exists of the corresponding surface of the lung, which also contains much dark pigmentary matter distributed throughout its substance. The specimen was removed from the body of a man *æt.* 50, who committed suicide. Presented by Sir Benjamin Brodie, Bart.

St. George's Hosp. Museum, Series VII, 84A.

187. Portion of a lung containing a rounded mass of firm light-coloured calcareous matter, enclosed by a capsule of dense fibrous material, which is closely adherent to the lung-tissue around. No recent scrofulous deposit existed in this or any other part of the lung; but the deposit was doubtless originally owing to the conversion of such matter. The specimen was removed from the body of E. T., who was supposed to have died of anæmia in the Hospital, August 14th, *æt.* 41. 'Post-Mortem and Case-Book,' p. 163.

St. George's Hosp. Museum, Series VII, 84B.

Total Excavation and Extreme Shrinking of the Lung.

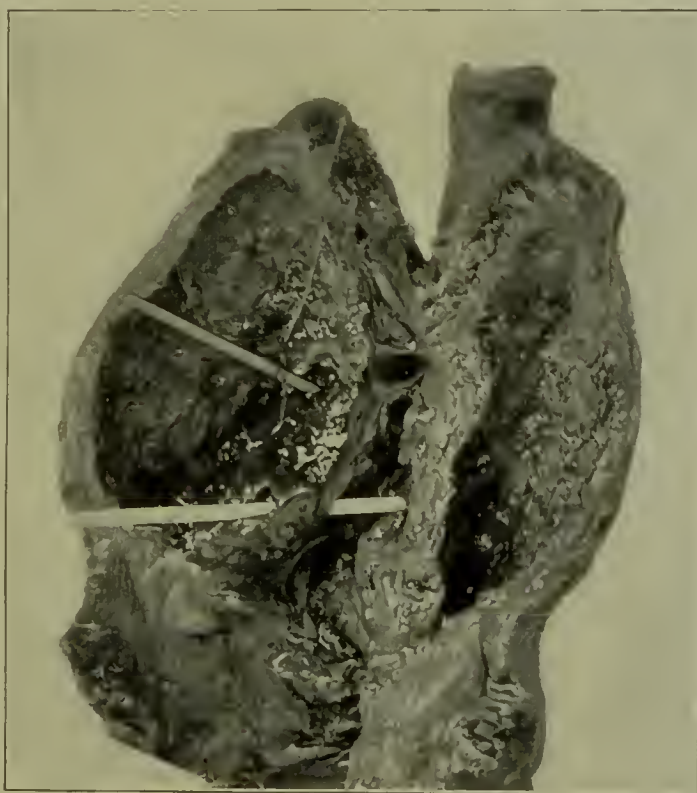
188. The specimen shows a vertical section through the left lung. The whole of this lung is now represented by a cavity three inches long by two inches broad, filled when first cut open with reddish purulent matter. The pleura around is greatly thickened. The two main divisions of the left bronchus open directly into the cavity, and through them glass rods have been passed, thus proving that this contracted cavity represents really the whole of the left lung. The right lung was hypertrophied and emphysematous, and showed evidence of old tuberculous disease.

From a boy, *æt.* 18, who was admitted into the hospital suffering from acute bronchitis, and died of the same four days later. The left side of patient's chest was greatly fallen in, and the heart was much drawn over to accommodate itself to the external shrinking of the left lung. Post-mortem evidence of acute bronchitis was found, but none of active tuberculous disease; thus complete arrest of the pulmonary tuberculosis seemed to have taken place.

Brompton Hosp. Museum, N. 207.

Obsolete Tubercle re-infecting.

189. A slice of lung showing chalky deposit and fibrosis as the result of chronic tuberculous change, with miliary tubercles around, as the result of fresh extension of the tuberculous infection. At the upper part are two chalky nodules enclosed in a pigmented and fibrous capsule, without any recent change around them. Lower down there is close to the pleura another similar nodule, larger in size, with fibrosis around, causing slight puckering of the adjacent pleura. Close to this latter nodule the lung-tissue is



Photograph of specimen 188.
Total excavation and extreme shrinking of a lung.
From the Brompton Hospital Museum.



studded with recent grey miliary granulations, and numerous similar granulations are seen through the lung on the other surface of the section.

Charing Cross Hosp. Museum, 669.

Double Aneurism of Ascending Aorta Complicating Chronic Pulmonary Tuberculosis.

190. The specimen shows an aneurism the size of a cricket ball arising from the ascending arch of aorta. The opening commences five eighths of an inch above the aortic valves, and is, roughly two and three quarters of an inch long by one and three quarters of an inch broad. The aneurism is filled with recent, probably post mortem, clot. A second aneurism arises from the anterior sinus of Valsalva. This is the size of a pigeon's egg, and projects directly into the cavity of the right ventricle. The aorta showed hardly any atheroma. The large aneurism had compressed the superior vena cava and also the bifurcation of the trachea and the left bronchus.

From a man æt. 33, who was admitted into the hospital suffering from extensive and active chronic pulmonary tuberculosis. On admission no signs of aneurism were observed, but during the last few weeks of life aneurismal dulness appeared to the right of the sternum, and extended somewhat rapidly. Dyspnœa and œdema of the face, due to pressure on the superior vena cava and the trachea, were also noticed. Post mortem both lungs showed extensive tuberculous disease, partly old, but in part also quite recent.

Brompton Hosp. Museum, 228.

Tuberculosis and Carcinoma of the Lung.

191. A section of a left lung presenting in the upper lobe and in the adjacent part of the lower lobe several large cavities with trabeculated walls. The rest of the lung is for the most part consolidated by cancerous deposit and contains numerous recent excavations. The pleura is much thickened, especially in the neighbourhood of the diaphragm, to which it is adherent. Under the microscope sections taken from the base show the lung tissue uniformly infiltrated by carcinoma, while sections from the upper lobe show the cancerous deposit co-existing with tuberculosis.

James B., æt. 42, was admitted under Dr. Bright in 1829, with a chronic cough and emaciation. At the autopsy malignant growth was found in the brain and liver, and in the cervical, axillary, and bronchial glands. There were vomices in the apex of the right lung. See 'Insp.,' vol. viii, p. 174.

Guy's Hosp. Museum, 327.

Tuberculosis of the Lung associated with Carcinoma.

192. A section of a left lung showing two large cavities, one at the apex and another at the upper part of the lower lobe. The latter, which is about two and a half inches in diameter, has the greater part of its wall lined

by a white flocculent deposit of carcinomatous tissue. A mass of growth is seen adhering to the pleural surface of the pericardium.

Guy's Hosp. Museum, 328.

Actinomycosis of the Lung.

193. A section of the lower lobe of a lung, the cut surface of which presents several nodules of consolidated lung tissue about half an inch in diameter. In the recent state these nodules consisted of a soft central white area surrounded by a deep red zone. Under the microscope the centre of the nodule is seen to be made up of small round cells, among which are numerous actinomyces, while in the periphery the alveoli of the lung are filled with extravasated red blood-corpuscles.

Henry L., an engraver, æt. 42, was admitted under Dr. Taylor for an abscess in the lumbar region, which was incised and drained. He was much emaciated, and had been ill for three months before admission. The discharge from the abscess almost ceased and the cavity contracted, but the temperature remained high, and the patient becoming gradually exhausted, died during an attack of syncope six weeks after the operation. At the autopsy the lumbar abscess was found to communicate with a ragged cavity at the lower part of the right lobe of the liver, in the walls of which were found numerous ray fungi. Several smaller actinomycotic nodules were found in the rest of the liver and throughout both lungs. See 'Insp.,' 1890, No. 330.

Guy's Hosp. Museum, 251.

PLEURÆ.

Acute Pleurisy.

194. Acute tuberculous pleurisy.
Charing Cross Hosp. Museum, 651A.

Pleura Showing Numerous Recent Caseating Tubercles.

195. The specimen shows a portion of the costal pleura containing numerous miliary tubercles in a stage of caseation. In the centre of the specimen these are much more closely aggregated together, and form a caseating irregular patch about the size of a florin, in which, however, the individual tubercles can still be made out.
Brompton Hosp. Museum, I 8.

Chronic Pulmonary Tuberculosis with Secondary Pleural Effusion.

196. The lung shows a good deal of recent tuberculous disease, for the most part of a racemose character, and commencing to caseate. The pleura is adherent over the upper lobe, and is considerably thickened. Over the lower lobe, however, the two layers are widely separated from each other, the intervening space having been occupied during life by about a



Photograph of specimen 196.

Chronic pulmonary tuberculosis with secondary pleural effusion.

From the Brompton Hospital Museum.



pint and a half of clear serous fluid. The pleural surfaces in this situation are covered with recent lymph, and several bands of adhesions cross the space from side to side. No actual tubercles can be seen here on the pleural surfaces, but at the very apex of the effusion, just where the pleura became adherent, the tuberculous invasion of the serous membrane is clearly seen.

From a labourer, æt. 44, who died with somewhat extensive and recent pulmonary tuberculosis affecting both lungs.

Brompton Hosp. Museum, N. 185.

Sub-pleural Hæmorrhage.

197. Section of a right lung showing changes due to advanced tuberculous disease. The pleura is thickened and ragged over the upper part of the lung, owing to the tearing of adhesions in its removal; at one place a cavity in the lung has been torn open. Sub-pleural hæmorrhages are visible, especially over the lower lobe. The cut surface shows scattered through the upper and middle lobes a number of irregular cavities, lined, some by a smooth, others by a ragged membrane. The lung tissue between these cavities is completely consolidated, and shows caseous area of tuberculous broncho-pneumonia with some fibroid change. There is, further, much patchy congestion, or even hæmorrhage, seen especially around the cavities and in their walls, giving a peculiar marbled appearance to the section. Some of the bronchi are dilated, and have thickened walls. In the lower lobe the changes are less advanced; the lung tissue is deeply congested, in places hæmorrhagic, and shows scattered groups of young caseous tubercles which have not yet begun to break down into cavities.

From a man, æt. 41, addicted to alcohol, who gave a history of cough, feverishness, and occasional hæmoptysis for five months before his death. The left lung was less affected than the one here shown, but one of the cavities had ulcerated into the pleura and caused pneumothorax. The larynx and the intestine showed tuberculous ulceration. There was cirrhosis of the liver with ascites. See 'Male Medical Register,' vol. iii, 1899, No. 31; and 'Medical Post-mortem Register,' vol. xxvi, p. 25.

St. Bart.'s Hosp. Museum, 1719D.

Formation of Thickened Pleura.

198. The specimen shows a section through the left lung. Advanced pulmonary tuberculosis is seen down the upper lobe, where there is marked shrinking of the organ; the layers of pleura are seen to be in places considerably separated; the space thus left is filled with gelatinous semi-translucent material. The pleuræ themselves are as yet hardly at all thickened, though it seemed probable that had the patient survived, the whole of the gelatinous material and the layers of the pleuræ themselves would have become converted into dense fibrous tissue, such as is seen, for example, in specimen No. 175.

Brompton Hosp. Museum, N. 173.

199. The specimen shows a very similar condition to that observed in the preceding one. The section shows the anterior half of the right lung. Considerable fibrosis and shrinking of the organ is seen, especially in the upper part, and as a result the layers of the pleura have become separated over the upper lobe, and also over a considerable portion of the lower lobe. The space thus left is again filled with gelatinous material, the precursor, as it would seem, of more dense fibrous tissue.

From a man, æt. 23, who died with chronic pulmonary tuberculosis and tuberculous ulcerations of the intestines. In addition he had suffered from rheumatic fever, and had presented during life symptoms and physical signs of mitral regurgitation; at the post-mortem examination definite evidence of this lesion was also observed.

Brompton Hosp. Museum, N. 186.

Thickened Pleura.

200. Section through a left lung showing the results of old tuberculous disease. The pleura is greatly thickened, and there is much shrinking and fibroid change in the lung. In the upper lobe is a large smooth-walled quiescent cavity, with prominent vessels on its walls; a smaller cavity lies above it, and there is another in the lower lobe. The bronchi are thickened, closely packed from shrinkage of the lung, and somewhat dilated. No recent tubercle can be detected.

From a man, æt. 30, who died of chronic phthisis (of about four years' duration) with lardaceous disease. There was recent active tubercle in the right lung with a small cavity at the apex. The left lung (shown in the specimen) was much shrunken, and was not visible on opening the thorax; the pleura was universally and densely adherent. See 'Medical Post-mortem Register,' vol. xxv (1898), p. 55; and 'Male Medical Register,' vol. i (1898), No. 10.

St. Bart.'s Hosp. Museum, 1669A.

Double Perforation of Pleura; Partial Pneumothorax; The Protective Action of the Adherent Pleura in Preventing Pneumothorax is also demonstrated.

201. In the mid-axillary line near the anterior portion of the lower lobe (left) a round hole in the pleura, the size of a goose-quill, is visible. This communicates directly with a ragged excavated portion of the lung, and the destruction of pleura, in this situation, was the cause of the pneumothorax. Over the entire upper lobe the layers of pleuræ are adherent; hence the pneumothorax remained partial in spite of the fact that a second and earlier rupture of the pleura had taken place in this region. The size and character of this earlier opening are closely similar to the opening in the lower lobe. But for the fact that the layers of pleura were adherent, a general pneumothorax would have been produced at this earlier period. The protective action of the adherent pleura in preventing pneumothorax is thus well exemplified.

From a man, æt. 27, who suffered from chronic pulmonary tuberculosis. There were no symptoms to point to the date when the pneumothorax occurred.

Brompton Hosp. Museum, M. 203.



Photograph of specimen 201.

Double perforation of the pleura with partial pneumothorax.

From the Brompton Hospital Museum.



Perforation of Pleura; Pneumothorax.

202. The specimen shows the posterior half of the lower lobe of the left lung. The section shows recent tuberculous disease of the lung, with marked caseation and softening. At a point posteriorly two inches below the apex of the lower lobe the pleura has ruptured. This has taken place within an area of about the size of a threepenny piece, where the pleura was extremely thin and evidently necrotic. The pleural cavity contained air and three ounces of clear serous fluid.

From a patient, æt. 16, who died from acute pulmonary tuberculosis, with a history of only four months' duration. In addition to the disease of the lungs, tuberculous ulceration of the intestines, larynx, and trachea was also found after death.

Brompton Hosp. Museum, N. 182.

203. A left lung with both the parietal and visceral layers of its pleura. The layers enclose a cavity which is crossed by two bridges, and in the recent state contained air and one and a half pints of turbid serum. Over a small area on the lateral aspect of the lung the two surfaces of the pleura are adherent, and immediately in front of this adhesion there is a small opening into the lung, indicated by a blue rod, which was found to communicate with one of the small bronchial tubes. The lung is compressed, and contained a few tubercles; there is no appearance of cavitation.

Margaret G., æt. 38, was admitted under Dr. Habershon for shortness of breath and pain in the chest of six weeks' duration. She had suffered from cough and occasional hæmoptysis for two years. A fortnight after her admission there were the physical signs of air in the left pleural cavity, and eight weeks later the patient died. At the autopsy the right lung presented a large cavity at the apex with fibroid induration of the lower lobe. See 'Insp.,' 1868, No. 116.

Guy's Hosp. Museum, 380.

Pyo-pneumothorax.

204. A portion of a left lung uniformly covered with a thick layer of recent lymph. On its lateral aspect, at the lower part of the upper lobe, there is an irregular opening in the pleura leading to a small cavity in the lung. The blue rod separates the pulmonary and thoracic walls, and exposes the posterior limit of the large cavity, which in the recent state contained pus and air. On the reverse of the specimen the lung shows a few small cavities and numerous miliary tubercles.

Henry D., æt. 47, was admitted under Dr. Moxon with the physical signs of air in the left pleural cavity. He had suffered from cough and occasional hæmoptysis for eighteen months. At the autopsy forty-four ounces of pus were found in the left chest, together with much air. There were many caseous tubercles in both lungs, and the intestines were extensively ulcerated. See 'Insp.,' 1867, No. 19.

Guy's Hosp. Museum, 379.

Fibroid Change in Subpleural Tubercle.

205. A left lung whose surface is thickly covered with narrow tortuous branching plates and points of fibroid tissue, having the glistening appearance and texture of cartilage. An area of deep pigmentation surrounds each of the plates and patches. The apex is firm fibroid, and shows appearances of old deposits of tubercle. The condition of the pleura may probably be ascribed to tuberculous formations in the subpleural lymphatics, which have undergone a fibroid change. From a man *æt.* 50, who had also spinal caries and disease of the sterno-clavicular joint. (See MS. Notes, vol. iv, p. 5). Presented by Guy's Hospital, 1899.

R.C.S. Museum. 3324B.

Pigmented Subpleural Tubercle.

206. Specimen showing accumulations of black material around each of a number of small scrofulous deposits, situated immediately beneath the pleura. Microscopical examination.—After immersion for many years in spirit the black material was found to consist of much granular and refracting matter, in which the pigment was situated. This was disposed in irregular masses, formed apparently for the greatest part by the accumulation of smaller particles; but in many places very decided and distinct oval and round-cells of various sizes existed, containing, some only semi-transparent matter, and some distinct black granular matter of exactly the same character as that in the isolated masses before spoken of. Some of the cells with dark pigmentary contents measured the $\frac{1}{2000}$ of an inch. Occasional large flattened cells like altered pavement epithelium were seen.

St. George's Hosp. Museum. Series VII, 83c.

Pigmented Fibroid Nodules beneath the Pleura. Not tuberculous.

207. A lung, the pleura of which is studded with numerous slightly raised nodules having a white fibrous centre, and surrounded by a black zone. The cut surface of the lung shows scattered miliary tubercles. Histologically the subpleural nodules consist of fibroid tissue with much surrounding pigmentation, and give no evidence of tuberculous origin.

William S., *æt.* circa 27, was admitted under Dr. Hilton, and died from tuberculous meningitis. See 'Insp.,' 1866, No. 164.

Guy's Hosp. Museum, 363.

TUBERCULOSIS OF THE ORGANS OF DIGESTION.

*TONGUE AND BUCCAL CAVITY.**Tuberculous Infiltration of the Tongue.*

208. A tongue, with the larynx and upper part of the trachea, showing at its root considerable swelling beneath the mucous membrane. The greater part of the epiglottis and the mucous membrane lining the larynx and trachea are destroyed by ulceration. Histological examination of the base of the tongue shows that the mucous membrane is intact, but that the tissue beneath it is infiltrated with a deposit of tuberculous nodules crowded with the specific bacilli.

Alfred M., æt. 42, was admitted under Dr. Taylor for phthisis with ulceration of the larynx. During the three weeks before his death a rapid destruction of the epiglottis was observed. At the autopsy there was recent and chronic phthisis of both lungs with numerous tuberculous ulcers in the intestines. See 'Insp.,' 1889, No. 470.

Guy's Hosp. Museum, 456.

Tuberculous Ulceration of the Tongue.

209. A portion of an injected tongue, the tip and under surface of which, as far as the frænum, are denuded of mucous membrane. The ulcerated surface thus left has a finely granular appearance, and its upper margin, which encroaches slightly upon the dorsum of the tongue, is somewhat raised and sinuous. Histologically the ulceration is tuberculous.

Perrette B., a man æt. 45, was admitted under Dr. Pye-Smith, and died from acute phthisis with tuberculous laryngitis. See 'Insp.,' 1888, No. 413.

Guy's Hosp. Museum, 457.

210. An injected tongue, with the pharynx and larynx. At the tip of the tongue there is an irregular ulcer with a slightly raised border. In the recent state its base was covered with minute grey granulations. Histologically the ulceration is tuberculous. There is an enlarged bursa in front of the thyroid cartilage. On the reverse of the specimen the larynx shows advanced tuberculous disease.

Henry D., æt. 38, was admitted under Dr. Pitt for phthisis. The ulcer on the tongue had been noticed for six months. At the autopsy there was tuberculous ulceration of the intestines. See 'Insp.,' 1887, No. 388; and 'Trans. Path. Soc.,' vol. xxix, p. 102.

Guy's Hosp. Museum, 458.

For Comparison—Leprosy of Tongue.

211. The tongue and larynx of a leper. The tongue is much tuberculated, and in parts ulcerated. There is some ulceration of the epiglottis, which is greatly thickened, as also are the arytæno-epiglottidean folds. Presented by Dr. Beaven Rake.

Guy's Hosp. Museum, 459.

Tuberculous Ulceration of the Soft Palate.

212. The larynx and trachea, with a portion of the soft palate, from a man æt. 56, who died with tuberculous phthisis. The epiglottis and larynx are deeply ulcerated over the greater portion of their surface. The edges of the epiglottis are eroded by the ulceration, and there is some considerable thickening of the arytæno-epiglottidean folds. The soft palate has also undergone a process of diffuse ulceration. See 'Medical Post-mortem Book,' vol. xii, p. 179.

St. Bart.'s Hosp. Museum, 1781A.

213. A soft palate, fauces, and larynx affected with tuberculous disease. A superficial ulceration of the mucous membrane extends over the greater part of the superior surface of the soft palate and uvula; the mucous membrane of the fauces is thickened and penetrated by numerous small ulcers. The margins of the epiglottis are superficially ulcerated, and also the mucous follicles upon it; the arytæno-epiglottidean folds and arytænoid cartilages are unnaturally distinct, and infiltrated with tuberculous material.

From a boy, æt. 15, who was admitted to the hospital for sore throat, which he stated had only existed about a week. The cervical lymphatic glands had been enlarged for eight months. He died exhausted. The post-mortem examination revealed general tuberculosis of the lung, and tuberculous ulceration of the intestines. See 'Darker Ward Book,' vol. vii, p. 204.

St. Bart.'s Hosp. Museum, 1801A.

Tuberculous Ulceration of the Tonsil.

214. The specimen shows tuberculous disease of the right tonsil. In its upper part is situated a large irregularly excavated ulcer, at the base of which are some calcareous nodules.

From a female patient æt. 19, who died from chronic pulmonary tuberculosis running a somewhat rapid course (history only six months' duration). After death, besides the tuberculous lesions in the lungs, caseation of the cervical and cœliac glands and tuberculous ulceration of the tonsils and intestines were found.

Brompton Hosp. Museum, A 9.

*PHARYNX.**Tuberculous Ulceration of the Pharynx.*

215. A larynx with the pharynx and upper part of the œsophagus. There is severe ulceration partly destroying the epiglottis and the aryæno-epiglottidean folds, and extending to the anterior and lateral walls of the pharynx.

Hannah B., æt. 22, was admitted under Dr. Perry for symptoms of phthisis, with dyspnoea and pain in swallowing. She was seven months pregnant, and died a week after her premature confinement. At the autopsy extensive tuberculous excavation of the lungs was found, and there were numerous ulcers in the ileum. See 'Insp.,' 1891, No. 157.

Guy's Hosp. Museum, 507.

216. A pharynx with the larynx showing tuberculous ulceration. The interior of the larynx is destroyed by ulceration, which has spread backwards and involved the anterior wall of the pharynx. The affected area has a worm-eaten appearance from the presence of numerous small irregular ulcers separated by swollen mucous membrane.

Elizabeth S., æt. 14, was admitted under Dr. Taylor with phthisis, from which she died. She was aphonic, but had no difficulty in swallowing. See 'Insp.,' 1892, No. 174.

Guy's Hosp. Museum, 508.

*ŒSOPHAGUS.**Ulceration of Œsophagus.*

217. The specimen shows tuberculous ulceration of the œsophagus.
Brompton Hosp. Museum, L 219.

Œsophagus adherent to Bronchial Glands.

218. An œsophagus showing two depressed black scars over adherent bronchial glands.

Charles B., æt. 44, was admitted under Dr. Habershon, and died of phthisis. See 'Insp.,' 1867, No. 291.

Guy's Hosp. Museum, 578.

Œsophagus perforated by Caseous Glands.

219. A portion of an œsophagus, the wall of which shows several irregular perforations communicating with caseous glands, the remains of which are seen adherent to the muscular coat.

Mary S., æt. 67, was admitted under Mr. Symonds for abscesses of the cervical region. She died of spinal caries and general tuberculosis. At the autopsy there was extensive caseation of the cervical and bronchial glands. See 'Insp.,' 1887, No. 317; and 'Trans. Path. Soc.,' vol. xxxix, p. 107.

Guy's Hosp. Museum, 579.

220. An œsophagus showing on its anterior wall the opening of a sinus, which communicates with a cavity produced by the suppuration of a mass of caseous glands surrounding the lower part of the trachea.

Herbert S., æt. 18 months, was admitted under Dr. Pavy with an empyema of the left chest. The child had suffered from cough and dyspnœa for three months. At the autopsy, pus from softening mediastinal glands was found to have made its way into the left pleural cavity. The left pulmonary artery was occluded by thrombus. See 'Insp.,' 1885, No. 192.

Guy's Hosp. Museum, 580.

STOMACH.

Tuberculous Ulceration of the Stomach.

221. A stomach showing upon the posterior wall, about one inch from the pylorus, a minute circular ulcer with undermined edges. Histologically the ulcer appears to be tuberculous. The lymphatic glands along the lesser curvature are enlarged and caseous.

Tom D., æt. 2, was admitted under Dr. Fagge for tuberculous broncho-pneumonia, from which he died. At the autopsy there were yellow masses in the brain, and caseous enlargement of the lymphatic glands. See 'Insp.,' 1881, No. 70.

Guy's Hosp. Museum, 658.

222. A stomach showing an ulcer situated upon its posterior wall one inch from the pylorus. The ulcer measures three quarters of an inch in its longest diameter, and its edges are much undermined. In the recent state its base presented several caseous nodules, but histological examination gives no clear evidence of its tuberculous origin. The loop of intestine included in the preparation has its serous surface thickly beset with tuberculous nodules, and the neighbouring lymphatic glands are enlarged and caseous.

Florence C., æt. 8, was admitted under Dr. Pavy for great emaciation, and died one week later from phthisis with tuberculous ulceration of the ileum and peritonitis. See 'Insp.,' 1880, No. 352.

Guy's Hosp. Museum, 659.

223. A stomach laid open to show upon its posterior wall, rather nearer to the pyloric than to the cardiac end, an irregular patch of superficial ulceration with sinuous edges and ragged base. On the reverse of the specimen the serous coat corresponding to the position of the ulcer is covered with miliary tubercles, and the lymphatic glands in the lesser curvature are enlarged and caseous.

William S., æt. 7, was admitted under Dr. Hale White for wasting, with painful and swollen abdomen, from which symptoms he had suffered for six weeks. He died two months after admission, and at the autopsy the peritoneum was covered with tubercles, and tuberculous lesions were found in the lungs, kidneys, intestines, and lymphatic glands. See 'Insp.,' 1892, No. 173.

Guy's Hosp. Museum, 660.

Tuberculous Infiltration of the Wall of the Stomach.

224. A portion of a stomach showing its greater curvature and posterior wall to be considerably thickened by a deposit of caseous material beneath the serous coat. The mucous membrane is unaffected. Histologically the deposit consists of small round-cells with numerous areas of caseation.

William G., æt. 48, was admitted under Dr. Barlow for tuberculous peritonitis of seven months' duration. At the autopsy the peritoneal cavity was found to be obliterated by adhesions, and there were numerous ulcers in the ileum. See 'Insp.,' 1856, No. 168.

Guy's Hosp. Museum, 661.

225. Portion of a stomach, with several small oval masses of tuberculous matter deposited beneath its peritoneal coat. A section has been made through one of them. From a lad who died with tubercles in his lungs and in many other organs.

St. Bart.'s Hosp. Museum, 1882.

Perforation of the Stomach in Tuberculous Peritonitis.

226. The anterior wall of a stomach with a portion of the liver, to which it is firmly adherent. About the middle of the greater curvature and an inch above it there are two small perforations leading into a cavity between the stomach and liver, containing caseous material. In a corresponding position upon the posterior wall there is an irregular patch of ulceration exposing the muscular coat.

Henry L., æt. 9, was admitted under Dr. Goodhart with fever, abdominal pain, and diarrhœa. Three days later he died, and at the autopsy the bronchial and mesenteric glands were found to be caseous, and there was tuberculous deposit in the lungs, spleen, and kidneys. See 'Insp.,' 1892, No. 124.

Guy's Hosp. Museum, 724.

INTESTINE AND PERITONEUM.

Tuberculous Ulceration of the Duodenum.

227. A portion of the first part of a duodenum showing a small rounded ulcer with thickened edges, situated half an inch from the pylorus. The base of the ulcer is formed by the muscular coat of the bowel, and miliary tubercles are visible beneath the peritoneum. Below is mounted a small piece of the ileum, exhibiting a well-marked tuberculous ulcer.

Stephen W., æt. 26, was admitted under Dr. Bright in 1837 for chronic phthisis. At the autopsy there were numerous ulcers throughout the intestines, and the mesenteric glands were caseous. See 'Insp.,' vol. xxv, p. 97.

Guy's Hosp. Museum, 747.

Small Intestine.

228. Portion of small intestine, with numerous minute, round, and oval masses of tubercle in the tissue of its peritoneal coat and in the adjacent part of the mesentery. The portions of the peritoneum between the tubercles appear healthy.

St. Bart.'s Hosp. Museum, 1879.

Tuberculous Ulceration.

229. The specimen shows a very early stage of a common form of tuberculous infiltration and ulceration of the intestine. Above a small swollen follicular gland is seen, with a slight breach on its surface, while the Peyer's patch below shows typical tuberculous infiltration at its upper end, and commencing ulceration.

St. Bart.'s Hosp. Museum, 2012B.

230. Portion of a small intestine. There are two small superficial ulcers on the mucous surface, and the peritoneum is studded with tuberculous nodules of various sizes.

From a child, æt. 3, who died with general tuberculosis. See 'Post-mortem Book,' vol. viii, p. 46.

St. Bart.'s Hosp. Museum, 2008.

231. A portion of jejunum showing typical tuberculous ulceration. The ulcers run in the transverse axis of the gut, their bases are irregular and tuberculated, and the serous surface of the gut is covered with numerous miliary tubercles, corresponding mostly to the course of the ulcers. Note the distribution of the tubercles along the blood-vessels on the serous surface, especially at the lower part of the specimen. See 'Medical Post-mortem Register,' vol. xxiii (1896), p. 112.

St. Bart.'s Hosp. Museum, 2012D.

232. The ulcers occupy the position of Peyer's patches, and are arranged in the long axis of the gut, instead of in the transverse axis, as is usually the case. The edges are thickened, and there is an extensive inflammatory area around the ulcer, the floor of which is uneven and tuberculous. The tuberculous nature of the ulcer is readily recognised on examining the peritoneal surface of the bowel, which shows numerous tubercles, especially over the area corresponding to the ulcers. See 'Medical Post-mortem Register,' vol. xxii (1895), p. 46.

St. Bart.'s Hosp. Museum, 2012A.

233. Portion of small intestine injected. Its canal has been laid open. Along the cut margin its walls are considerably thickened, and the layers of which they are composed can be easily recognised. Their thickness is chiefly due to the deposit of masses of tubercle in the subserous coat, to which the diseased condition appears to be limited.

St. Bart.'s Hosp. Museum, 1876.

234. Portions of small intestine, firmly united by thick layers of organised lymph, in which, as well as in the coats of the intestines, there is abundant formation of tuberculous matter. Presented by S. G. Lawrence, Esq.

St. Bart.'s Hosp. Museum, 1883.

235. A portion of small intestine laid open (natural colours preserved), showing a number of typical tuberculous ulcers transverse to the long axis of the gut, with infiltrated thickened edges, and floor studded with miliary tubercles well seen on the peritoneal surface. From a case in Brompton Hospital, 1898. Presented by Dr. Arkle.

Charing Cross Hosp. Museum, 759.

236. A lengthy piece of small intestine, its natural vascularity preserved, showing numerous ulcers of varying size throughout its mucosa, the larger of them irregular in shape, extending down to the serous coat. The edges of the ulcers are thick and infiltrated, and the floors of the ulcers can be seen studded with grey and white miliary tubercles.

Julia R., æt. 6. Tuberculosis of lungs, glands, kidneys, and intestines. The whole of the intestine from jejunum down to cæcum was in the condition seen in the specimen. In large intestine there was only one ulcer, situated in descending colon. Illness dated from an attack of whooping-cough twelve months before; mother died of phthisis. Dr. Bruce's cases. Post-mortem 2168, May 2nd, 1899.

Charing Cross Hosp. Museum, 759A.

Ulceration and Perforation.

237. Portion of a jejunum in which a tuberculous ulcer has completely perforated its coats, making an aperture nearly half an inch in diameter at the bottom of an ulcer of rather wider extent. At the upper part of the intestine there is another ulcer, which has at one part extended through the muscular as well as the mucous coat. The peritoneal coat of the intestine is thinly covered by soft lymph.

St. Bart.'s Hosp. Museum, 2015.

Tuberculosis of the Ileum.

238. Two portions of the lower end of an ileum showing a general enlargement of the agminated and solitary glands, which histologically are seen to be infiltrated with characteristic tuberculous deposit. There is little, if any, ulceration.

Alfred W., æt. 23, was admitted under Dr. Pye-Smith with pyrexia and the physical signs of tuberculosis of the lungs. He had been ill for three years, and died a few days after his admission. At the autopsy there was old and tuberculous disease in the lungs, with dilatation of the bronchial tubes. See Insp. 1891, No. 417.

Guy's Hosp. Museum, 845.

Tuberculous Ulceration of the Ileum.

239. The specimen shows numerous typical tuberculous ulcers affecting the intestinal wall. The bases of the ulcers are nodular, and their edges somewhat thickened, while on their peritoneal surface numerous recent tubercles are visible.

From a male patient, æt. 21, who died from chronic pulmonary tuberculosis with secondary tuberculous ulceration of the intestines and chronic tuberculous peritonitis.

Brompton Hosp. Museum, N 255.

240. The lower end of an ileum which has been injected, and is mounted to show extensive tuberculous ulceration. On the reverse of the specimen miliary tubercles are seen as yellow dotted lines running in the course of the lymphatics beneath the serous coat. The mesenteric glands are caseous.

Robert H., æt. 31, was admitted under Dr. Bright in 1841, for phthisis and anasarca of four months' duration. At the autopsy the liver was found to be cirrhotic, and there was considerable ascites. See 'Insp.,' vol. xxxi, p. 177, and 'Prep.,' 1554 (54), second edition.

Guy's Hosp. Museum, 848.

Tuberculous Ulcers of the Ileum with Adhesion and Perforation.

241. A coil of ileum with its mesentery, beneath the serous covering of which numerous miliary tubercles are visible. The intestine has been opened at one part to show a tuberculous ulcer. The blue rod indicates a perforation in the base of a similar ulcer, which in the recent state was closed by adhesion to the neighbouring intestine.

From Miss P., æt. 13, who died from phthisis of three months' duration. At the autopsy the Fallopian tubes were caseous and an abscess was found in the ischio-rectal fossa. See 'Insp.,' vol. viii, p. 55.

Guy's Hosp. Museum, 851.

Tuberculous Stricture of the Ileum.

242. A portion of an ileum laid open to show an annular constriction half an inch in length, due to the contraction of an irregular ulcer, which encircles the bowel. Above the constriction the gut is much dilated and its wall hypertrophied. On the reverse of the specimen miliary tubercles are visible beneath the serous coat, which is roughened by filamentous adhesions.

From a woman who was admitted under Dr. Barlow in 1851 for constipation, vomiting, and distension of the abdomen. These symptoms were relieved by the administration of opium, and diarrhœa supervened. She died from phthisis.

Guy's Hosp. Museum, 861.

243. A portion of an ileum laid open to show two strictures resulting from contraction following tuberculous ulceration. At the seat of constriction the gut is narrowed to about one half its normal diameter, and its lumen is crossed by several fibrous bands covered by mucous membrane. Histologically the muscular and submucous coats are infiltrated by small-cells, some of which have undergone caseation. There are a few giant-cells.

Sarah L., æt. 18, was admitted under Dr. Goodhart for abdominal pain and diarrhœa of about one year's duration. She died the day after her admission, and at the autopsy the intestines were firmly matted together, and the pelvis contained a pint of foul sero-pus. There were several chronic ulcers scattered through the ileum, and there was a perforation in the cæcum. There was no evidence of tuberculous disease in any other part of the body. See 'Insp.,' 1891, No. 24.

Guy's Hosp. Museum, 863.

244. A portion of an ileum, exhibiting a tuberculous stricture. The narrowing of the bowels is quite sudden, and its calibre is reduced to a diameter of a quarter of an inch. Presented by Dr. H. Handford, 1888.

R.C.S. Museum, 2521B.

245. Another portion of the same ileum, with a similar tuberculous stricture laid open. The mucous membrane around the whole circumference of the bowel at the seat of stricture is thickened, granulated, and in parts superficially ulcerated.

From an adult affected with phthisis. Three strictures in all existed in the small intestine.

R.C.S. Museum, 2521C.

Multiple Tuberculous Strictures of the Ileum.

246. A coil of intestine from the lower end of an ileum, mounted to show its calibre, considerably narrowed at several points from contraction consequent upon tuberculous ulceration. Numerous tubercles can be seen beneath the serous coat, and there are enlarged caseous glands in the mesentery.

Ann B., æt. 12, was admitted under Dr. Barlow for tabes mesenterica of four months' duration, and died about a fortnight after admission. At the autopsy there was old and recent tuberculous disease of the lungs, and the bronchial glands were caseous. There were numerous ulcers in all parts of the intestines. See 'Insp.,' 1858, No. 215.

Guy's Hosp. Museum, 862.

247. A longitudinal section through a loop of small intestine and the cæcum, removed by operation from a man, æt. 34, who had suffered for some months with symptoms of chronic obstruction. The ends of the gut remaining behind were joined by means of a Murphy's button, and the patient did extremely well after the operation. The wall of the gut below the cæcum (as the specimen hangs) is greatly thickened for a distance of

several inches, so that there is a considerable stricture. This thickening also extends into the ileo-cæcal valve, and beyond it into the cæcum. On examining the loop further away from the cæcum, several annular strictures will be observed, where the ridges of the valvulæ conniventes and the intestinal wall are especially thickened; but also between these annular strictures the wall is considerably infiltrated and thickened. It will further be seen that there are a number of ulcers corresponding to the sites of the annular strictures, best seen on the free border of the gut, opposite to the mesenteric attachment. On turning the specimen round, it will be seen that under the serous coat, corresponding to the sites of the annular strictures there are small collections of nodules; but smaller nodules will also be found scattered about in other situations, especially below and in the part just below the cæcum where the infiltration is most exaggerated and the stricture most pronounced. The lymphatic glands are enlarged.

A small portion of the loop has been hung up separately to show the appearance of the annular constrictions before the bowel was opened. The lesion is a tuberculous one, as proved by microscopical examination.

The patient made an uninterruptedly good recovery, the button coming away in ten days. The patient was alive and well ten months afterwards.

St. Bart.'s Hosp. Museum, 2012c.

Cæcum and Appendix.

248. The lower end of an ileum with the cæcum and its appendix. The mucous membrane is extensively destroyed by tuberculous ulceration. The chief ulcers in the ileum and cæcum are large and oval; those in the cæcum have their long axis at right angles to the axis of the canal, and, in some instances, nearly encircle it. Mingled with the larger are a few smaller ulcers, which may have originated in the solitary follicles, and are chiefly found in the appendix of the cæcum. The general characters of the ulcers are that they are circumscribed by an elevated, slightly undulating border, which just overhangs their bases, and is nowhere everted; and that their bases are irregularly excavated, and raised in the intervals between the excavations, as by the crowding and coalescence of small ulcers and of intervening tuberculous deposits.

St. Bart.'s Hosp. Museum, 2009.

Tuberculous Ulceration of Cæcal Appendix.

249. A cæcal appendix injected and laid open to show numerous irregular ulcers upon its mucous surface. Beneath its serous coat are seen several miliary tubercles.

Guy's Hosp. Museum, 957.

Tuberculous Ulceration of the Colon.

250. A portion of a colon, the mucous membrane of which is almost entirely destroyed by ulceration. The ulcerated surface is roughened, and in some places the muscular coat is exposed. The edges of the persistent mucous membrane are irregular in outline, prominent, and undermined.

Philip W., æt. 25, was admitted under Dr. Pavy for wasting and constant diarrhœa of three months' duration. He died ten days after admission, and at the autopsy there was tuberculous disease of the lungs and larynx. There were numerous ulcers in the small intestine, in which the bacilli of tuberculosis were found. See 'Insp.,' 1890, No. 86A.

Guy's Hosp. Museum, 855.

251. Tuberculous ulceration of the ileum and colon. Polypoid projection. Large irregular patches of the intestinal wall are deeply eroded and undermined. The ileo-cæcal valve is all but destroyed. One of the polypoid projections frequently seen as a result of dysenteric ulceration appears on its site.

From the body of a man æt. 25, who died in the hospital of general tuberculosis. 'Post-mortem and Case-book,' 1869, No. 344.

St. George's Hosp. Museum, Series IX, 111C.

Rectum and Anus—Fistula.

252. The specimen shows tuberculous ulceration, with but little infiltration of the rectum. There is also a tuberculous fistula *in ano* which opens internally above the internal sphincter. From a case of chronic pulmonary tuberculosis.

Brompton Hosp. Museum, M 207.

253. Preparation showing two fistulæ *in ano*, neither of which has any internal opening. The larger one, however, is separated from the gut only by a very thin membrane, which appeared to be a new formation, closing the aperture, which most probably had originally existed. The patient, Peter P., æt. 33, died of phthisis. The duration of the fistulæ was not exactly known. 'Post-mortem and Case Book,' 1859, p. 55.

St. George's Hosp. Museum, Series IX, 151F.

254. Lower part of the rectum showing several fistulous openings commencing with a large abscess, and with several cavities within the surrounding areolar tissue. The specimen was removed from the body of a patient who died of phthisis. Presented by Sir B. C. Brodie.

St. George's Hosp. Museum, Series IX, 151B.

Recto-prostatic Fistula.

255. A portion of a rectum with the urinary bladder and prostate, showing a recto-prostatic fistula. The point of communication between the rectum

and prostate is indicated by a piece of catheter. The rectum is ulcerated for a distance of two inches from the anus. The bladder is thickened, and its mucous membrane is everywhere ulcerated. The fistulous connection with the rectum opens into the prostatic portion of the urethra at a point situated immediately below the sphincter vesicæ on the left side of the caput gallinaginis. The glandular portion of the prostate has sloughed, and is converted into an abscess cavity. From a man æt. 32, who had long suffered from general tuberculosis. See 'Male Surgical Register,' vol. v, 1888, No. 714.

St. Bart.'s Hosp. Museum, 2056A.

Tuberculous Peritonitis.

256. Disseminated tuberculosis of the peritoneum.

London Hosp. Museum, 139A.

257. The specimen shows the pleura covering the under surface of the diaphragm. It is seen to be studded all over with tubercles, which in places have become confluent, forming large white patches. All show commencing caseation. The remainder of the peritoneum was also thickly studded with tubercle, though except in the region of the right kidney not to the same degree as shown in the specimen. The peritoneum contained twenty ounces of slightly turbid fluid.

From a male patient æt. 41, who died from chronic pulmonary tuberculosis with acute tuberculous peritonitis. In addition there was tuberculous disease of the cartilage of the fourth rib, and lardaceous disease of the liver, kidney, spleen, and intestines. No tuberculous ulceration of the intestinal tract was found.

Brompton Hosp. Museum, M 27.

258. Piece of diaphragm obtained from the body of a man æt. 27, who died of general miliary tuberculosis. The peritoneal surface of the diaphragm is thickly studded with grey miliary tubercles. (Fixed in formalin and preserved in glycerine.) See 'Medical Post-mortem Register,' vol. xxiv (1897), p. 110; and 'Male Medical Register,' vol. ii (1897), No. 98.

St. Bart.'s Hosp. Museum, 1883c.

259. Portion of intestine, the peritoneal surface of which is closely studded with tubercles. The peritoneum is injected; its surface is obviously roughened and covered with a delicate layer of lymph, which can readily be detached. The line of attachment of the mesentery shows that it was considerably thickened and contracted.

From a man æt. 23, who died of general tuberculosis, with tuberculous peritonitis. There was advanced tuberculous disease of the left kidney and of the bladder. The intestines were not ulcerated, the peritoneal coat alone being affected. There were tuberculous foci at the apices of both lungs surrounded by recent miliary tubercles. See 'Male Medical Register,' vol. iv (1898), No. 196; and 'Medical Post-mortem Register,' vol. xxv, p. 291.

St. Bart.'s Hosp. Museum, 1883D.

260. Portion of the transverse colon, with the omentum tucked up and adherent to it. In the subperitoneal tissues of these parts much scrofulous deposit exists, causing very considerable thickening, in one part to the extent of above half an inch, and giving the appearance as if the intestine was of that diameter. The whole formed a large tumour, which was adherent to the abdominal walls by recent fibrin; and the entire surface of the peritoneum was thickly studded with miliary scrofulous deposits. Similar deposits and vomicae existed in the lungs. The preparation was removed from the body of Francis K., æt. 47, who died in the hospital, October 11th, 1843. For details see 'Post-mortem and Case-book,' 1842-3, p. 54.

St. George's Hosp. Museum, Series IX, 62C.

PANCREAS.

261. The pancreas of a child who died of tuberculous meningitis. At the lower end is seen a deposit of white tuberculous matter, while just above this is a small cavity formed by the breaking down of similar material. See 'Medical Post-mortem Book,' vol. xvi, p. 86.

St. Bart.'s Hosp. Museum, 2272A.

LIVER.

Miliary Tuberculosis.

262. Piece of liver of child æt. 2 years, who died of general tuberculosis, with tuberculous meningitis. The surface of the liver shows numerous typical miliary tubercles. (Fixed in formalin, and preserved in glycerine). See 'Surgical Post-mortem Register,' vol. xxiv (1897), p. 9, and 'Female Medical Register,' vol. iv (1897), No. 13.

St. Bart.'s Hosp. Museum, 2196A¹.

263. Liver of a child æt. 4, showing disseminated miliary tuberculosis.

London Hosp. Museum, 134B.

Cirrhosis of Liver and Miliary Tuberculosis.

264. Portion of a liver showing the results of passive congestion added to those of alcoholic cirrhosis. Miliary tuberculosis is also present. The capsule is slightly thickened, and the surface of the organ distinctly nodular. Both surface and cut section show numerous pale areas of various sizes, corresponding to areas of degenerate liver tissue. Some of the smaller ones are possibly miliary tubercles (which are demonstrable microscopically). Scattered throughout the organ are patches of deep congestion,

due to heart failure. A microscopic section is preserved in the 'Histological Records,' xxi, 2199A¹. See 'Male Register, vol. iii (1898), No. 19, and 'Medical Post-mortem Register,' vol. xxv (1898), p. 2.

From a man æt. 46, a heavy drinker, who had suffered from syphilis. He had been troubled with cough and occasional hæmoptysis for three years. Three months before death ascites and dropsy of the legs occurred. He died of heart failure, associated with extensive tuberculous lesions of the lungs and intestines, and with cirrhosis of the liver and dropsy. The liver weighed 52 oz.

St. Bart.'s Hosp. Museum, 2199A¹.

Caseation.

265. A portion of the right lobe of a liver presenting at its upper and hinder part a pale wedge-shaped area, the base of which, beneath the capsule, measures about 3 inches. The section shows the liver at this part to be invaded by a speckled yellow deposit, which under the microscope exhibits small-celled infiltration, giant-cells, and caseous foci. The capsule of the organ appears to be normal.

William V., æt. 35, was admitted under Dr. Pye-Smith for phthisis of six months' duration, and died four weeks after admission. At the autopsy the larynx was found to be ulcerated, and there were miliary tubercles in the kidneys. The liver was greatly enlarged, and its surface was studded all over with yellowish-white patches similar to that seen in the preparation. See 'Insp.,' 1876, No. 21; and 'Path. Soc. Trans.,' vol. xxvii, p. 196.

Guy's Hosp. Museum, 1330.

Tuberculous Abscess.

266. Section of a portion of liver containing a circumscribed tuberculous abscess. The abscess wall is covered with shreds of partially organised lymph. The specimen was obtained from a patient who died of pulmonary phthisis.

St. Bart.'s Hosp. Museum, 2196A.

Multiple Tuberculous Abscesses.

267. A portion of the left lobe of a liver, the greater part of which is occupied by caseous material. In some parts softening has occurred with the production of abscesses, which are separated from each other by fibrous trabeculæ. Below is mounted a small portion of the same lobe, beneath the capsule of which projects an abscess the size of a hazel nut. There is chronic perihepatitis.

George K., æt. 33, was admitted under Dr. Pavy for serofulous disease of the genito-urinary organs, symptoms of which had been noticed for about twelve months. He died five days after admission, and at the autopsy the lungs, mesenteric glands, the left kidney, the bladder, the prostate, and testes were found to be affected by tuberculosis. See 'Insp.,' 1878, No. 244.

Guy's Hosp. Museum, 1332.

Fatty Liver.

269. Portion of liver in extremely fatty condition. The whole organ was very large, pale, and mottled, and showed when examined microscopically a considerable accumulation of oil-globules in the hepatic cells throughout its texture.

The specimen was removed from the body of Annie S., æt. 38, who was brought into the hospital February 6th, 1850, with phthisis, and died February 22nd, having suffered from symptoms of ulceration of the bowels. For details see 'Post-mortem and Case-book,' 1850, p. 37.

St. George's Hosp. Museum, Series IX, 167A.

TUBERCULOSIS OF THE THORACIC DUCT AND LYMPHATIC GLANDS.

THORACIC DUCT.

The following specimen was probably obtained from one of the "Three Cases of Obstruction of the Thoracic Duct," dissected by Sir Astley Cooper, and described by him in the 'Medical Record and Research,' vol. i, in the year 1798.

270. Portion of a thoracic duct in which in three situations are obstructions, due, as would appear from the following description, to tuberculous disease.

The description of the specimen, when recent, is as follows:—Upon laying open the duct, the first impediment was found to be occasioned by two valves placed near to the receptaculum chyli, which were much thicker than natural, and projected into the duct, so that their superior edges were pressed firmly together. An inch from these, and higher in the duct, two other valves appeared diseased in a similar manner, only in a greater degree. These were also so much thickened as to fill the canal, and they formed a barrier beyond which no fluid could pass. On further examination a third disease was perceived, which seemed to have been originally seated in the valves, although it had proceeded so far as to destroy their regular figure, and entirely to obliterate the tube. Beyond this last disease, which was placed opposite the curvature of the aorta, the duct appeared in a natural state, and opened in its usual manner into the veins. The morbid changes here observed seemed to have been of a scrofulous kind; the valves were hollow, and contained a substance between their laminae, having the same curd-like appearance with that commonly found in scrofulous abscesses. The lungs were loaded with tubercle.

St. Thomas's Hosp. Museum, 1734.

*LYMPHATIC GLANDS.**Caseating Cervical Glands.*

271. A slice through a large group of caseating glands removed from the neck. (Spirit preparation.) No history.
Charing Cross Hosp. Museum, 874A, B.

Tuberculous Bronchial Gland.

272. A bronchial gland laid open to show early tuberculous change. The gland is swollen and congested, and in its substance are seen three or four minute grey miliary tubercles.
Charing Cross Hosp. Museum, 874A, B, C.
273. A much-enlarged bronchial lymphatic gland situated below the bifurcation of the trachea. It is deeply pigmented by absorbed particles of carbon, and shows many foci of caseation. Microscopically it shows ordinary caseating tubercle. From a man æt. 42, who died of tuberculous peritonitis. The mesenteric and lumbar glands were caseous. No tubercles were found in any of the viscera. See 'Male Medical Register,' vol. i (1898), No. 12; 'Medical Post-mortem Register,' vol. xxv (1898), p. 26.
St. Bart.'s Hosp. Museum, 2284B.
274. Specimen consisting of half a trachea having a number of lymphatic glands connected with its lower part, in a state of chronic enlargement. They form a large nodulated mass, their cut surface exhibiting a glossy greyish semi-transparent aspect, with a varying proportion of black matter. Microscopical examination.—They were found to consist of a partly granular and partly homogeneous basis-substance, with scarcely any fibrous elements, containing a multitude of nuclei, and pale, round, and oval granular cells. Acetic acid dissolved the basis substance, which in places contained oily matter. No fluid or juice could be squeezed out of the mass. The specimen was removed from the body of Thomas M., æt. 43, who died in the Hospital, October 17th, 1848, of phthisis.
St. George's Hosp. Museum, Series X, 5A.

275. The anterior half of the lungs, trachea, and bronchi, together with the heart and posterior part of the pericardium, showing extensive caseation of the bronchial and tracheal lymphatic glands. At the root of the neck is a large packet of caseous glands, which descend as low as the top of the pericardium, while a caseous gland is seen projecting into the pericardial sac between the pulmonary artery and the aorta. There is no pericarditis; seen from the back the caseous glands surround the trachea and bronchi, and on the left side extend along the left bronchus for a considerable distance into the lung. A caseous track also extends downwards from the glands below the left bronchus over the pleura at the inner part of the left lower lobe, and towards the base, where it actually involves the lung itself. The bronchi appear narrowed, but this is due

to the section not passing through their middle. There is no ulceration into the trachea or bronchi. The left lung shows some small racemose groups of caseous broncho-pneumonia in the upper lobe, and in the lower lobe are confluent patches of caseous broncho-pneumonia, which has not softened. The right lung shows scattered groups of caseous tuberculous broncho-pneumonia, and in the upper lobe there is a caseous nodule the size of a pea, which is probably a caseous bronchial gland. The pleural surface of the right lung is studded with raised groups of tuberculous patches of pneumonia, but the lobes are not adherent; on the left side the lobes are adherent, and the lower part of the left lower lobe is converted into a solid caseous mass. A large gland at the bifurcation of the trachea is undergoing softening. From a child æt. fifteen months. Post-mortem, 301, 'Med. Reg.' 1217, 1897.

Middlesex Hosp. Museum.

Tuberculous Mesenteric Glands.

276. Half of a mesenteric gland showing extensive tuberculous disease. The gland is enlarged to size of an egg, and is caseous throughout. (Natural colours.) Mr. Bloxam's cases. Post-mortem, 2200. June 15th, 1899.)
Charing Cross Hosp. Museum, 874.

277. Portions of small intestine and mesentery. The mesenteric glands are greatly enlarged, and the lacteal vessels on their surfaces and passing from them to the intestine are distended with an opaque white substance like chyle. Many of the vessels thus distended are traced into the coats of the intestine. From the Museum of Sir A. P. Cooper.

R.C.S. Museum, 2841.

278. A chain of lymphatic glands, enlarged from the deposit of tubercle secondary to disease of the hip-joint. The lower portion, to which the left common iliac artery is attached, was situated round the brim of the pelvis, and led from the suppurating hip-joint; the upper part of the specimen lay along the left side of the aorta, and extended as high as the diaphragm. They were very firm and gritty when cut. There was no enlargement on the right side, either of the pelvic or abdominal glands. See 'Female Surgical Register,' vol. iv (1890), No. 143. The hip-joint from the same case is preserved in Series II, No. 570c, to which refer for the history of the case (No. 68).

St. Bart.'s Hosp. Museum, 2284A.

Results of Tuberculosis.

279. A tuberculous lymphatic gland from beneath the angle of the jaw. Its interior is completely hollowed out and converted into a cyst by an abscess. Presented by F. S. Eve, Esq.

R.C.S. Museum, 2839A.

Calcification of Diseased Glands.

280. Bronchial glands, nearly the whole substance of which is replaced by earthy matter.

St. Bart.'s Hosp. Museum, 2285.

281. Caseous foci are seen in the midst of a somewhat fibroid stroma. White patches in the caseous foci indicate areas of calcification. Removed from beneath the upper end of the sterno-mastoid muscle of a young man.

Charing Cross Hosp. Museum, 874A.

Compression and Ulceration of Trachea and Bronchi by Tuberculous Glands.

282. The lungs, larynx and trachea, with the adjoining structures, removed from a child æt. 5 months. The lungs are tuberculous and studded with caseous nodules (caseous broncho-pneumonia). The bronchial glands are considerably enlarged, and in parts caseous (tuberculous), and adherent to each other. They surround and press upon the arch of the aorta and the large vessels, the aorta especially having been pressed upon. Behind there is an abscess cavity below the bifurcation of the trachea, which communicates with a ragged cavity in the left lung. The latter is also in direct communication with the left bronchus, the wall of which has in part been destroyed by ulceration. The mucous membrane of the trachea near the bifurcation, and of the right bronchus is in a condition of superficial ulceration (erosion). There were also tuberculous ulcers in the intestines, and tuberculous deposits in the spleen. The abdominal lymphatic glands were generally caseous. See 'Medical Post-mortem Register,' vol. xxii (1895), p. 81, and 'Male Medical Register,' vol. iii, Part II (1895), No. 201.

St. Bart.'s Hosp. Museum, 1664M.

283. A dissection showing the left lung, the heart and great vessels, the bronchi, trachea, and larynx, and the lymphatic glands in the neighbourhood of these structures from a child's body. The lung is riddled with tuberculous deposits and vomicæ, especially those about the roots of the lungs, which seriously compress the main bronchi.

St. George's Hosp. Museum, Series X, 5c.

Compression of the Pulmonary Arteries and Veins.

284. Bronchial glands, with the bifurcation of the trachea and the adjacent parts. The bronchial glands are much enlarged, and tuberculous matter is deposited in them. The vena cava superior is flattened, and its calibre much reduced. Both the main branches of the pulmonary artery are also much compressed by the enlarged glands.

St. Bart.'s Hosp. Museum, 1756.

285. A child's heart, with a cluster of bronchial glands greatly enlarged, indurated, infiltrated with tuberculous matter, and compressing the trachea and principal branches of the bronchi, and the pulmonary arteries and veins.

St. Bart.'s Hosp. Museum, 1757.

286. A complete dissection of the larynx, trachea, and its bifurcation, with the adjoining structures, from a case of tuberculosis. The lymphatic glands around the aorta and the bifurcation, as well as the cervical glands, are all enlarged, yet not fused, but more or less discrete. One of the tracheal glands behind has been laid open to show the caseation. It is interesting to note the encroachment upon the arch of the aorta and the large vessels, which must have caused some narrowing, and some resistance to the circulation. The left bronchus is also somewhat pressed upon, and slightly constricted. Amongst other things the specimen also shows a small ulcer at the right processus vocalis. At the post-mortem examination the lungs were found to be tuberculous, as also the pericardium and peritoneum, the omentum especially being much thickened, and converted into a thick triangular mass. The spleen and abdominal glands were also tuberculous. See 'Medical Post-mortem Register,' vol. xxii (1895), p. 337, and 'Male Medical Register,' vol. i, Part II (1895), No. 292.

St. Bart.'s Hosp. Museum, 1664L.

Calcareous Bronchial Gland Ulcerating into Left Bronchus and Branch of Pulmonary Artery.

287. The red glass rod in the specimen marks the situation formerly occupied by the calcareous bronchial gland. This space communicates directly with the left bronchus, the wall of the latter having been ulcerated away. The blue probe lies in the large branch of the pulmonary artery, which had also given way through the extension of the ulcerative process. The patient died from hæmoptysis.

From a female patient æt. 15, who suffered from chronic pulmonary tuberculosis. After death tuberculous lesions were found also in the intestines and larynx, and in the bronchial, mesenteric, and retroperitoneal glands.

Brompton Hosp. Museum, D 5.

Compression of Nerves.

288. The larynx, trachea, and adjacent parts, showing a large mass of bronchial glands in a state of caseation and softening. The right pneumogastric nerve is so firmly adherent to the glands that it was impossible to isolate it by dissection. The left nerve was quite free.

From a boy æt. 8. His illness commenced rather more than a fortnight before his admission to hospital. He had a hacking cough, which gradually

increased in severity, and became paroxysmal, with fits of extreme dyspnœa, resembling spasmodic asthma. Tracheotomy was performed, but gave no relief, and he died with double pleurisy, broncho-pneumonia, high temperature, and coma. Presented by Dr. Goodhart, 1875.

R.C.S. Museum, 2848.

TUBERCULOSIS OF THE THYROID GLAND.

289. The thyroid gland with the larynx, tonsils, and soft palate of a child showing two caseous tubercles at the lower part of the isthmus, and three more similar nodules at the upper part of the right lobe, and two at the posterior part of the left lobe.

From a case of general tuberculosis in a child, æt. 4. Post-mortem, 285, 1897.

Middlesex Hosp. Museum.

290. Caseous tubercle in the thyroid gland. The left lobe has discharged a tuberculous abscess into the œsophagus. The opening is of the size of a sixpence; just above it is a small orifice admitting a probe. On the right side are several openings into the œsophagus from a tuberculous abscess arising in the glands, also a small opening into the trachea.

From a man æt. 23, who had caries of the spine in two places, and tubercle in both lungs. No symptoms pointing to thyroid or œsophages. 'Post-mortem Book,' 1896, No. 262; 'Trans. Path. Soc.,' vol. xlvii.

St. George's Hosp. Museum, Series X, 24A.

TUBERCULOSIS OF THE SUPRA-RENAL GLANDS. ADDISON'S DISEASE.

This is stated to be the first case in which any connection was thought to exist between the discoloration of the skin and the disease of the capsules. See 'Dr. Addison's Works, New Sydenham Soc.,' p. 217.

291. The supra-renal bodies with the kidneys. The right supra-renal is much contracted, and is converted into dense fibrous tissue. The left, which in the recent state was as large as a hen's egg, presents a central abscess cavity with caseous contents and fibrous wall.

James W., æt. 32, was admitted under Dr. Golding Bird in 1850. For three years his skin had been becoming darker, and for one year he had suffered from extreme weakness with progressive anæmia. He died from pericarditis, and at the autopsy "no chronic disease was found except that of the supra-renal capsules."

Guy's Hosp. Museum, 1545.

292. The supra-renal bodies, incised to show their structure, replaced by caseous and calcareous deposit.

Henry P., æt. 26, was admitted under Dr. Addison for vertigo, headache, and occasional fainting fits, from which he had suffered for one month. For six months he had complained of pains in the back and legs, and for two or three months his face had been observed to be discoloured. On admission he was found to have an angular curvature of the spine, his complexion was of a dirty yellow tint, and the inside of his lips was stained nearly black. He died four weeks after admission, having suffered from constant hiccough during the last few days of his life. At the autopsy the first and second lumbar vertebræ were found to be carious, and there was a large psoas abscess. The lungs contained tubercles. See 'Insp.,' 1854, No. 234; 'Dr. Addison's Works, New Sydenham Soc.,' p. 222; and 'Drawings,' 159 (67), and 353 (17).

Guy's Hosp. Museum, 1546.

293. The supra-renal bodies with the kidneys and portions of the aorta and vena cava, mounted to show the supra-renals converted into a mass of fibro-caseous material, in which under the microscope giant-cells are seen.

Robert B., æt. 12, was admitted under Dr. Addison with discoloration of the skin, pain in the epigastrium, and frequent sickness. He died eight and a half months after the onset of symptoms, and at the autopsy the whole of the body was of a brown hue except the palms of the hands and the soles of the feet. But for the supra-renal bodies the viscera were healthy. See 'Insp.,' 1859, No. 143; 'Prep.,' 1641 (10), 2nd edition; and Wax Models 358, 359.

Guy's Hosp. Museum, 1548.

294. The supra-renal bodies with the kidneys and their vessels mounted to show the supra-renals somewhat enlarged and converted into a yellow fibro-caseous material embedded in which are white cretaceous deposits.

George A., æt. 23, was admitted under Dr. Habershon in a prostrate and depressed condition, with excessive pigmentation of the skin. The face was of an olive-brown colour, and the genital organs very dark, the discoloration elsewhere being but slight. He sank from exhaustion ten days after admission, and at the autopsy the apex of the right lung presented a fibrous nodule with a cretaceous centre. See 'Insp.,' 1861, No. 75.

Guy's Hosp. Museum, 1549.

295. The kidneys and supra-renal bodies, from a case of Addison's disease. The substance of both supra-renal bodies is completely destroyed by tuberculous disease. Microscopical examination showed the presence of typical miliary tubercle, but no bacilli were discovered. The kidneys appear to be healthy.

From a boy æt. 14, who had been ill for twelve months preceding his death. He had well-marked bronzing of his skin, but there was no evidence of tuberculous disease during life. Presented by T. R. Atkinson, Esq.

St. Bart.'s Hosp. Museum, 2321A.

296. The supra-renal capsules from a woman who died with Addison's disease. The organs are large and firm, the right being larger than the left, and measuring two and a quarter inches in length. On section, the right capsule is seen to contain numerous yellow patches, each of which

is surrounded by a bluish-white tissue, cutting like cartilage, and closely resembling it in appearance. The yellow patches appear to consist of caseous material, but they are hard and firm, cutting like horn. There is no normal tissue remaining, so far as can be seen by the naked eye. The left capsule is apparently affected in a similar manner; but the yellow material is not so marked, and is confined to the medullary portion. Microscopically the degenerating portions of the gland were tuberculous, and contained tubercle bacilli.

From a married woman *æt.* 23, the mother of four children. She had been ailing since the birth of the first child, six years previously. On admission to the Victoria Park Hospital she was found to be suffering from phthisis. Her complexion was sallow, but the skin of her face, neck, arms, and hands were tinted of a light brown. There were numerous bright brownish-black spots covering the tinted area. The spots did not disappear on pressure. They were especially well-marked about the ears, cheek, and neck, and they appeared in crops. Two months after the admission of the patient she was seized with excessive vomiting, which lasted four days, when she became comatose, and died. At the autopsy a small consolidated patch was found at the apex of the right lung; but with this exception the lungs and all the other thoracic and abdominal organs were healthy. See 'Transactions of the Pathological Society,' vol. xl, p. 300. Presented by V. D. Harris, M.D.

St. Bart.'s Hosp. Museum, 2322A.

297. Section through a kidney and supra-renal body. The supra-renal body is enlarged, and completely transformed into caseous material.

From a boy *æt.* 15 years. The cause of death was not clear, though at the time he was under treatment for tuberculous disease of the tarsus. At the autopsy the body was emaciated, and showed distinct yellowish-brown pigmentation; there was old and recent tuberculosis of the lungs and tuberculous disease of the right foot. Both supra-renal bodies were similarly affected. The case was apparently one of Addison's disease. See 'Surgical Post-mortem Register' (1897), p. 233; and 'Male Surgical Register,' vol. iii (1897), No. 2106.

St. Bart.'s Hosp. Museum, 2325A.

298. Adrenal from a case of generalised tuberculosis showing numerous caseous foci scattered throughout an otherwise normal-looking gland, each focus surrounded by a zone of congestion. (Natural colours, 1898.)

Charing Cross Hosp. Museum, 880c.

299. One half of a kidney with adrenal vertically bisected; the kidney healthy, the adrenal greatly enlarged—converted into a firm caseous mass enclosed in a thickened capsule. (Natural colours.) Presented by Dr. Montague Murray, 1897. From a child *æt.* 13.

Charing Cross Hosp. Museum, 880f.

300. From a man *æt.* 32. There were tuberculous spinal disease (dorsal to one lumbar vertebræ), tubercle of vesiculæ seminales and epididymis, and old fibrous patches in the lung. Bronzing was well marked. 'Post-mortem Book,' 1889, No. 282.

St. George's Hosp. Museum, Series X, 34D.

TUBERCULOSIS OF SPLEEN.

Disseminated Miliary Tuberculosis.

301. Spleen of a child showing disseminated miliary tuberculosis.
London Hosp. Museum, 134C.
302. Half of a spleen of a child affected with general tuberculosis, showing its substance studded with yellow caseous nodules of varying size; a zone of congestion surrounding each tuberculous focus. Natural colours. From a child æt. 3 months. Dr. Abercrombie's cases, post-mortem 1783, February 27th, 1897.
Charing Cross Hosp. Museum, 871K.
303. Half a spleen and spleniculus, both studded on their cut surface with numerous small tubercles. Tubercles can be seen also on the surface under the peritoneum. The specimen was obtained from a girl æt. 2 years. Fixed in formalin and preserved in glycerine. See 'Medical Post-mortem Register,' vol. xxiv (1897), p. 7; and 'Female Medical Register,' vol. iv (1897), No. 9.
St. Bart.'s Hosp. Museum, 2301B.

Caseous.

304. Section of a spleen and spleniculus showing caseous yellow tubercles. The tubercles are numerous and in places confluent. From a child who died of acute general tuberculosis. Presented by J. Graham Forbes, Esq., M.B.
St. Bart.'s Hosp. Museum, 2301E.
305. A spleen infiltrated with masses of tubercle, some of which are softening in the centre. From a man æt. 25, who died from tuberculous meningitis. Both lungs contained scattered masses of tubercles, chiefly grey. At the right apex was a caseous mass about the size of a hazel-nut, and at the left apex were three cavities, the largest capable of holding half an ounce of fluid. There was a nodule of yellow tubercle, about the size of a pea, in the frontal region of the left hemisphere of the brain. The liver and kidneys were not affected. The patient during life had complained of aching pain over the region of the spleen. The disease had been seven months in progress. Presented by Dr. Herbert J. Ilott, of Bromley, Kent.
St. Bart.'s Hosp. Museum, 2303.

306. Half of a spleen, showing extensive caseous tuberculous deposits. The spleen is enlarged, and on its outer surface are seen several pale, yellow

raised nodules, the largest of which is the size of a cherry; the smallest are only the size of a pin's head. The cut surface shows some softening of the larger nodules, and also shows that the larger nodules are formed by the aggregation of smaller caseous foci. From a man æt. 44, who was admitted under the care of Dr. Cayley with tuberculous peritonitis. Post-mortem, 17, 1898. 'Med. Reg.,' 1446, 1897.

Middlesex Hosp. Museum, 1616.

307. Taken from a case of generalised tuberculosis in a woman æt. 30. The tuberculous masses are caseous, and for the most part of small size. There is chronic perisplenitis. 'Post-mortem and Case-book,' 1898, 226. St. George's Hosp. Museum, Series X, 51F.

308. A portion of an enlarged spleen, on the cut surface of which are seen numerous rounded and irregular-shaped areas of a yellowish colour and firm consistency. They occupy roughly one half of the section, and similar nodules project beneath the capsule of the organ. Histologically they have the structure of caseous tubercle.

Albert G., æt. 6, was admitted under Dr. Washbourn for continued fever and enlargement of the spleen. He died nine weeks after the commencement of his illness, and at the autopsy a bronchial gland was found to be caseous, and there was tuberculous disease of the lungs, liver, intestines, and kidneys. The spleen weighed 10 oz. and contained two infarcts. See 'Insp.,' 1893, No. 96.

Guy's Hosp. Museum, 1518.

TUBERCULOSIS OF THE BRAIN AND SPINAL CORD, AND THEIR MEMBRANES.

Tuberculous Meningitis.

309. Tuberculous meningitis. The subarachnoid space (cisterna basalis) is full of pus. The optic chiasma (2) has been displaced during the removal of the brain; pus surrounds the olfactory tracts (1) and fills the subarachnoid space in the fissure of Sylvius on each side. The velum interpositum shown on the opposite side of the specimen is opaque, and contains pus. The tonsils were enlarged, and there were miliary tubercles scattered through the lungs. From a girl æt. 3.

London Hosp. Museum, 836A.

310. A specimen of tubercle of the pia mater removed from the brain of a child who died of tuberculous meningitis.

Charing Cross Hosp. Museum, 945A.

311. A portion of the cortex of the brain from the region of the Sylvian fissure, showing the pia mater studded with minute grey miliary tubercles, the natural colour of the surrounding tissues being well preserved.

Wm. B., æt. 2, tuberculous disease of tibia and cerebellum. Mr. Boyd's cases. Post-mortem 2062, October 16th, 1898.

Charing Cross Hosp. Museum, 945B.

Tuberculous Tumours of Cerebrum and Dura Mater.

312. Section of the upper part of one hemisphere of a cerebrum, exhibiting a large oval mass of caseous matter in its substance and between the membranes. A portion of the dura mater has a thick layer of tuberculous matter adhering to its inner surface.

St. Bart's. Hosp. Museum, 2489.

313. Tuberculous tumours in the brain and dura mater.—The dura mater from the calvarium, and a portion of the brain from the surface of one hemisphere. On the inner surface of the dura mater are two sessile tumours of rounded outline and finely nodulated surface. The tumours are both situated posteriorly, one on each side of the falx, that in the left being the further back. At the back of the specimen is one half of a third and larger tumour of similar form, which seems to have been removed from another part of the dura mater. The section of this tumour shows it to be caseous with a crescentic tract of softening. In the piece of brain is another smaller tumour immediately under the surface of the pia mater. An incision has been made into the brain through it. It is seen to have a reniform section, with its outer surface flattened by contact with the calvarium. It is caseous and softened in the centre. It appears to have no connection with the brain substance, but to be a tumour of the membranes like those above described.

London Hosp. Museum, 142.

Tumours in the Cerebellum.

314. Part of the cerebellum, showing a scrofulous tumour appearing at the surface of the posterior portion of the left lobe. After maceration in spirit for some time the tumour presented the following histological appearance : —It showed a large amount of clear, refracting, granular matter, and great numbers of small cells, chiefly of a rounded or irregularly oval form, though some were more elongated. These cells contained much dark granular matter, but nothing like distinct nuclei. The addition of acetic acid rendered the cells larger, but did not bring any nuclei to light. The patient died of hydrocephalus.

St. George's Hosp. Museum, Series VIII, 68A.

315. Specimen showing a scrofulous tumour in the upper part of the cerebellum containing a certain amount of calcareous matter. The microscopical appearance, after maceration for a long time in spirit, was the same as in the preceding preparation. The specimen was removed from a child who was subject to epileptic attacks.

St. George's Hosp. Museum, Series VIII, 68B.

316. Portion of cerebellum showing a scrofulous tumour in the inferior vermiciform process, the surrounding brain substance being unaffected. Softening of the fornix and of the walls of the ventricles existed, and the so-called "exudation corpuscles" were found coating the blood-vessels of these parts and of the cerebral hemispheres.

The specimen was removed from the body of a child, æt. 3, who had fallen into a cachectic state, owing apparently to living in an unhealthy district. He was recovering by means of change of air, etc., when he returned to the same locality, and shortly after this he became suddenly affected with symptoms of hydrocephalus, of which he died.

St. George's Hosp. Museum, Series VIII, 68D.

317. Tuberculous tumour in left hemisphere of cerebellum. Tuberculous nodules found elsewhere. From body of a patient æt. 9, who suffered from vomiting, headache, squinting, and retraction of head; supposed to be due to meningitis. Her former history was very defective. Post-mortem and Case-book, 1888, p. 150.

St. George's Hosp. Museum, Series VIII, 68H.

Tuberculous Tumour of Cerebellar Peduncle and Pons.

318. A vertical transverse slice through the pons and cerebellum on the level of the middle cerebellar peduncle. Situated in the left middle cerebellar peduncle is a large caseous mass (30 mm), and somewhat congested area of condensed tissue. The mass projects but little on the surface, and had caused no inflammation or pressure on meninges, and none of the cranial nerves were involved in their surface course.

The swelling lay between the superficial origin of the fifth nerve and that of the seventh and eighth nerves on the left side. The mass extends upwards into the left side of the pons, becoming however much smaller, measuring only 5 mm. in circumference. As it does so, however, it extends inwards to the raphé, and also across into the opposite side, forming another caseous mass, 16 mm. in diameter, in the pons on the side opposite the larger mass in the middle cerebellar peduncle, and occupying the very centre of this half of the pons.

Charing Cross Hosp. Museum, 952.

Tuberculous Masses in Pons.

319. A slice of the pons from the preceding case, showing the two tuberculous masses, and the extension of the one (the smaller) into the other across the raphé.

The natural appearances of caseating centre and congested zone around, which such tuberculous masses present, are well seen.

Charing Cross Hosp. Museum, 952A.

320. A pons and cerebellum divided into two parts (natural colours preserved), showing a large tuberculous mass, occupying the centre of the pons, and extending upwards and downwards from that point. The mass lies adjacent to the floor of the fourth ventricle. The mass is tuberculous. Presented by Dr. Murray, 1900.

Charing Cross Hosp. Museum, 952B.

321. A series of five sections taken through the pons Varolii, showing a deposit of tuberculous material. The sections are taken at the following levels, each being seen from the under side :

- i. Below the pons, through the superficial origin of the auditory nerve.
- ii. Through the fourth ventricle, at the level of the striæ acusticæ.
- iii. Through the lower part of the pons, at about the level of the superficial origin of the facial nerve.
- iv. A little below the centre of the pons, and through the upper part of the fourth ventricle, at the level of the superior fovea.
- v. Through the pons and upper part of the fourth ventricle, at the level of the superficial origin of the fifth nerve.

The tuberculous material is seen to be scattered irregularly through the deeper parts of the pons. Before the sections were made the tumour projected as two small nodules on the right side of the floor of the fourth ventricle, just above the auditory striæ. The specimen was hardened in Muller's reagent, some of the colour of which still remains. From a man æt. 40, in whom no other evidence of tubercle could be found. (See Medical Post-mortem Register, vol. xv, p. 294. See also Pathological Society's Reports for 1890). The Morbid Growths Committee of this Society reported that the tumour was tuberculous in nature.

St. Bart's. Hosp. Museum, 2492A.

322. Scrofulous deposit within the medulla oblongata and pons Varolii. It is in the form of two masses of the size of a hazel-nut, round in shape, firm and concrete, and of a yellowish-white colour. They occupied—one the central, upper, and right portion of the medulla, about $\frac{1}{8}$ th of an inch in thickness only of its anterior surface being left entire; the other, the

anterior or lower and right part of the pons Varolii, projecting into the fourth ventricle. Decided softening of the posterior part of the crura cerebri existed, and smaller scrofulous deposits were found in the cerebral hemispheres also, as well as in the lungs and several of the viscera.

The preparation was removed from the body of S. H., who was admitted into the hospital April 1st, 1853, with headache, abdominal pain, and diarrhœa, frequent pulse, and a peculiar oscillating motion of both eyeballs, especially of the right one. Numbness and cold of the left upper extremity existed. The latter symptoms had been complained of for about a year, the others for two or three years. Difficulty in moving the head, dysphagia, and indistinct articulation preceded death, which occurred six weeks after her admission. For details, see 'Post-mortem and Case-book,' 1853, p. 113, and 'Path. Soc. Trans.,' vol. vi, p. 40; also 'Brit. and For. Med.-Chir. Review,' No. xlviii, October, 1850, D. 508.

St. George's Hosp. Museum, Series VIII, 67c.

Tuberculosis of Spinal Cord.

323. Specimen showing the presence of a large quantity of scrofulous deposit external and very adherent to the dura mater, covering the spinal cord at a point corresponding to the last cervical and first dorsal vertebræ. The deposit is larger in quantity on the left side of the cord, and firmly surrounds the roots of the nerves issuing from the cord at that part, but especially those on the left side. The lower part of the cervical and upper part of the dorsal portions of the cord are softened, and opposite the seventh cervical and first dorsal vertebræ it is almost diffuent. Moreover, the posterior surface of the bodies of the cervical and of the three upper dorsal vertebræ were deprived of all ligamentous covering, and the intervening cartilages were almost completely destroyed; the opposed bony surfaces being carious. The anterior surface of the bodies of the five or six upper dorsal vertebræ were eroded and bathed in thick pus. The lungs were œdematous, and the lower part of the right one was hepatised.

The preparation was removed from the body of Robert G., æt. 20, who in 1856 had been a dispensary patient under Dr. John W. Ogle's care, and was subsequently removed to the hospital. His illness began with pains about the shoulders and neck, and tenderness on pressure of the upper part of the spine. Subsequently a sense of weakness in the arms came on, especially in the right one, and headache was experienced. By degrees he had a difficulty in walking without supporting the chin with his hands, and at one time dysphagia came on. He lost power in moving his legs, especially the right one, and subsequently lost sensibility in these limbs. When admitted into the hospital, September 17th, 1857, he was almost unable to move his legs, which, in bed, were wont to become drawn up involuntarily; the hamstring muscles becoming rigid. He had a severe attack of dyspnœa, with slight cough and tightness across the chest, of which he died March 4th. For details see 'Post-mortem and Case-book,' 1857, p. 50; also 'Beale's Archives,' vol. iv, No. xiv.

St. George's Hosp. Museum, Series VIII, 88c.

324. Tuberculous spinal pachymeningitis.
Guy's Hosp. Museum, 1562⁶⁶.

Tumours of the Cord.

325. Specimen showing infiltration (and consequent thickening) of the lower part of the cervical region of the spinal cord with scrofulous matter. The membranes corresponding to the affected part are seen to be thickened and adherent to it. When recently examined the deposit was found to give a very solid character to the cord, and was of a light yellow colour. Above the deposit the spinal cord was vascular and softened, but in other places it was healthy. A large collection of scrofulous deposit was found in the optic thalami, and a small cretaceous deposit in one of the lungs; but none in any other organ.

The specimen was removed from the body of Michael K., æt. 13, who was brought into the hospital May 2nd, 1849. For some weeks he had suffered from gradual loss of power in the arms and legs, and when admitted he had lost all power over the sphincters of the anus and bladder. There was much pain in the neck when the patient was admitted, and this was found to be increased on pressure, and also on moving the head backwards, and there was slight priapism. The arms became permanently crossed on the breast, and any attempt to remove them caused great pain. Subsequently rigidity of the right sterno-cleido-mastoid muscle came on. For sometime before death bed-sores appeared, and the patient died September 10th. The chief remedy resorted to was counter-irritation to the nape of the neck. For further details, see 'Post-mortem and Case-book,' 1849, p. 186; also 'Beale's Archives,' vol. iv.

St. George's Hosp. Museum, Series VIII, 101c.

TUBERCULOSIS OF THE GENITO-URINARY SYSTEM.

KIDNEY.

Miliary Tuberculosis.

326. Kidney of a child æt. 4, showing disseminated miliary tuberculosis.
London Hosp. Museum, 134D.
327. One half of a kidney of an infant æt. one year and a half, who died of general tuberculosis. Natural colours preserved, showing a number of grey miliary tubercles—both on the surface and in the substance. Dr. Abercrombie's cases; post-mortem June 24th, 1898.
Charing Cross Hosp. Museum, 897A.
328. The half of a lobulated kidney, the capsule of which has been removed to show upon the surface of the organ several white well-defined spots about one sixteenth of an inch in diameter, produced by the presence of miliary tubercles.

George B., æt. 6, was admitted under Dr. Rees for emaciation and bronchitis following an attack of measles eight weeks before admission. At the autopsy the bronchial glands were found to be caseous, and there were miliary tubercles in the lungs, liver, and spleen. See 'Insp.,' 1856, No. 132; and 'Preps.,' 263 and 1515.

Guy's Hosp. Museum, 1629.

329. The half of a kidney, on the surface of which are seen several small white nodules half embedded in its substance, each about the size of a millet seed. Histologically the nodules have the structure of tubercle.

George S., æt. 10, was admitted under Dr. Addison for a cough of seven weeks' duration, and died three weeks later from general tuberculosis. At the autopsy the bronchial glands, lungs, liver, and meninges of the brain, pericardium, and spleen were found to be affected. See 'Insp.,' 1858, No. 2; and 'Preps.,' 1445 (50), 2007 (50) [2nd edit.], and 1329.

Guy's Hosp. Museum, 1630.

Tubal Nephritis.

330. The half of a kidney which is injected, and in the recent state presented a speckled appearance resulting from fatty degeneration of the tubal epithelium.

Mary S., æt. 25, was admitted under Dr. Bright in 1825 for œdema of the legs of two months' duration. The urine was found to be albuminous, and to have a specific gravity of 1014. While in the hospital she suffered from urgent dyspnœa and frequent diarrhœa. She died two months after admission, and at the autopsy tuberculous excavation was found in the apex of the right lung, and there was considerable serous effusion into the pleural and peritoneal cavities. In describing the kidney Dr. Bright says:—"Internally the whole cortical structure was of a pretty uniform yellowish colour, with many small opaque and indistinct yellow spots." See 'Insp.,' vol. ii, p. 28; and 'Bright's Medical Reports,' part 1, p. 12, pl. 2.

Guy's Hosp. Museum, 1606.

331. Section through a right kidney showing moderately advanced tuberculous lesions. Caseous nodules as large as a cherry are present, and are commencing to break down. They appear to have started in the pyramids, and extended into the cortex.

From a boy æt. 11, who died of general tuberculosis. He had been treated for some years for a variety of tuberculous affections, including spinal caries and tuberculous arthritis. See 'Surgical Post-mortem Register' (1897), p. 271; and 'Male Surgical Register,' vol. v (1897), No. 3178.

St. Bart.'s Hosp. Museum, 2341.1.

332. Section through a tuberculous kidney (left) obtained after death from a man æt. 47 years. The specimen shows typical tuberculous deposits, mostly in the cortex, and under the capsule, which has been partly stripped off. (Fixed in formalin and preserved in glycerine.)

St. Bart.'s Hosp. Museum, 2341H.

333. Section through a tuberculous kidney obtained from a boy at ten years, who died with hip-disease. (The specimen has been fixed with formalin and preserved in glycerine). See 'Surgical Post-mortem Register' (1896), p. 158.

St. Bart.'s Hosp. Museum, 2341G.

KIDNEY.

Chronic Tuberculosis.

334. One half of a kidney with its natural colours preserved, showing extensive changes the result of chronic tuberculous disease. The kidney is greatly enlarged, and its surface presents a somewhat mottled appearance from the presence of numerous small miliary and caseous tubercles, scattered throughout a generally congested and inflamed kidney substance. At parts these nodules have fused with one another to form larger yellow masses.

On section the kidney substance is seen hollowed out into large irregular cavities, with thickened and inflamed walls coated with caseating material. Very little kidney structure remains; any remaining not yellow and caseous can be seen to be studded with greyish miliary tubercle granulations. The walls of the pelvis and ureter are greatly thickened, and the mucosa infiltrated with tubercle.

Charing Cross Hosp. Museum, 897B.

335. Section of a kidney in the substance of which there are large masses of scrofulous deposit. The natural structure of the organ has been minutely injected. Presented by Dr. Fincham.

St. George's Hosp. Museum, Series XI, 33B.

336. A kidney greatly enlarged, so as to measure seven and a half inches in length. Its interior is occupied by a mass of caseous material in which are seen numerous ragged cavities occupying the situation of the pyramids of the organ. The capsule of the kidney is somewhat thickened. Histologically the renal tissue is seen to be replaced by caseating tubercle.

Guy's Hosp. Museum, 1633.

337. A kidney somewhat enlarged and incised to show its calices dilated and lined by a rough caseous material. In the cortical portion of the kidney are numerous nodules having a similar caseous structure. On the reverse of the specimen the ureter is seen to be thickened, its mucous membrane being replaced by tuberculous deposit. Sections cut and examined ninety years after the death of the patient showed under the microscope a characteristic tuberculous infiltration, with caseation and numerous giant-cells.

Anne B., æt. 52, was admitted under Dr. Marcet in 1807 for diarrhoea and painful micturition. She had been ill for twelve months, and died exhausted and despondent twenty-eight days after admission. At the autopsy ulcers were found in the colon, and the left kidney contained about two ounces of pus. The mucous coat of the bladder was almost entirely destroyed by ulceration. See 'Old Museum Book,' No. 75.

Guy's Hosp. Museum, 1634.

338. The left kidney, showing an extreme condition of tuberculous nephritis. The kidney is small, weighs three ounces, and was firmly adherent to the

perinephritic tissues. Its surface is lobulated. On section the position of the renal pelvis is occupied by yellowish-white mortar-like material, which is gritty in parts. These caseous masses are separated from one another by fibrous septa. There is a large excess of fat in the renal pelvis. The pelvis of the kidney is occupied by a mortar-like material similar to that found in the renal pyramids. There is practically no secreting renal substance left. The opposite kidney weighed 10 ounces, and was free from tubercle.

From a man æt. 60, who died with an epithelioma of the cheek. Post-mortem 260, 'Surg. Reg.,' 1371, 1897.

Middlesex Hosp. Museum, 1785A.

339. Kidney removed during life from a man æt. 36. The kidney is enlarged, and shows extensive tuberculous deposits on the surface. On section there are several irregular deposits, and near the lower end there is some loss of kidney substance. The ureter is thickened.

Middlesex Hosp. Museum.

340. Section of a tuberculous kidney. The kidney tissue has been almost entirely destroyed, and its place is occupied by cheesy deposit filling loculi, which correspond roughly to the pyramids and their equivalent cortical areas. These areas are mapped out on the surface of the kidney, giving it a lobulated aspect. The pelvis of the kidney is little affected, and the ureter and bladder were natural. The opposite kidney was unaffected.

From a woman æt. 50. The condition of the kidney was unsuspected during life, the urine having showed nothing abnormal. See 'Medical Post-mortem Register,' vol. vi (1897), p. 292.

St. Bart.'s Hosp. Museum, 2340.

Tuberculous Pyonephrosis—Nephrotomy.

341. The posterior half of a left kidney partially detached from an investment of dense fibrous tissue. The cut surface of the organ shows the pelvis and calices to be dilated and lined by a thick shaggy layer of fibro-caseous material. The exterior of the kidney is irregularly nodulated, and presents numerous minute cysts. A blue rod indicates the opening left after lumbar nephrotomy.

Edward E., æt. 32, was admitted under Dr. Moxon with a tumour in the left groin associated with pyuria. He had suffered from symptoms of renal disease for one year. The tumour was explored by Mr. Bryant and ten ounces of pus were evacuated. At the autopsy the right kidney was healthy and showed compensatory hypertrophy. The spleen was firmly adherent to the left kidney. See 'Insp.,' 1870, No. 175.

Guy's Hosp. Museum, 1638.

Tuberculous Pyonephrosis with Impacted Calculus.

342. A tuberculous kidney with a large calculus impacted in the commencement of the ureter. The kidney is much increased in size, but its secreting tissue is for the most part atrophied. The bulk of the organ is occupied by a series of large cavities, which represent the greatly dilated pelvis and infundibula. The cavities are everywhere lined by a ragged layer of caseous material. The ureter is thickened and lined by similar material. Microscopic examination.—The kidney shows the characteristic structure of tubercle; giant-cells are numerous.

St. Bart.'s Hosp. Museum, 2358.

343. A horseshoe kidney with the vessels, ureters, and bladder attached. The calices of the right kidney, which do not communicate with those on the left side, are very much dilated, and their lining membrane is thickened and granular. Its cortical structure is much wasted. The upper end of the ureter and the pelvis of the left kidney are greatly enlarged, but the calices are less affected. Some of the latter are lined with a thick layer of tuberculous material. Both ureters are dilated and thickened throughout their whole length, and the mucous coat of the bladder has exfoliated, leaving the muscular tissue exposed. Presented by St. Thomas's Hospital, 1892.

R.C.S. Museum, 3583, C, B.

BLADDER, PROSTATE, PENIS, VESICULÆ SEMINALES.

344. The left kidney and the bladder from a case of tuberculous disease of the genito-urinary tract. The pelvis of the kidney is dilated, and is partially absorbed. The glandular substance appears fatty. In the cortical portion are two or three large cavities which in the recent condition were filled with thin pus. The bladder is much hypertrophied and inflamed, and there is some diffuse inflammation about its neck. The prostate is the seat of a tubercular deposit; it is surrounded by an abscess of about the size of a large walnut, which opened into the membranous portion of the urethra.

From a man æt. 43, who had suffered from stricture for twenty-four years; he died of general tuberculosis. See 'Male Surgical Register,' vol. iii (1885), No. 162.

St. Bart.'s Hosp. Museum, 2412C.

345. The bladder and testes from a case of tuberculosis of the genito-urinary tract. The mucous membrane of the bladder is ulcerated, whilst the prostate is converted into a large abscess. The vesiculæ seminales are greatly enlarged, and the vas deferens is thickened and cord-like. The

epididymis of each testicle is also enlarged, and is converted into a caseating mass, and the body of either testis presents numerous patches of tubercle.

From a man æt. 48, who suffered for two years before his death from tuberculous disease of the genito-urinary tract. After eighteen months he presented symptoms of general tuberculosis. At the autopsy the lungs were found to be a mass of tubercle.

St. Bart.'s Hosp. Museum, 2412D.

346. The urinary organs of a child æt. 9 years, in an advanced stage of tuberculous disease. The mucous membrane of the bladder is rough and thickened; it has lost its natural polish, and is thickly set with small circular ulcers. The ulceration has in many places been succeeded by caseous degeneration, and close to the orifice of the left ureter the mucous membrane has been extensively destroyed. The kidney contains several large caseating masses, which are mostly situated in the neighbourhood of the pyramids, the cortical portion of the gland being nearly free. The right ureter, which is laid open, presents several ulcers similar to those found in the bladder.

St. Bart.'s Hosp. Museum, 2412B.

Tuberculosis of Bladder.

347. A urinary bladder inverted to show the mucous membrane, which in parts is thickly studded with miliary tubercles. They are most thickly aggregated around the orifice, and extend in a broad band along the posterior surface to the apex. The sides of the bladder are comparatively free. There was no ulceration of the mucous membrane. In the recent state the tubercles appeared as grey or pale yellow granulations, slightly raised upon the surface of the pink mucous membrane. From a man who died with tuberculosis. Presented by E. Hurry Fenwick, Esq., 1884.

R.C.S. Museum, 3677A.

348. A bladder, beneath the mucous membrane of which project several rounded nodules varying in size from a line to a quarter of an inch in diameter. The right ureter at its orifice is thickened, and there are numerous areas of superficial ulceration, some circular and others irregular in shape, scattered throughout the interior of the bladder.

John J., æt. 22, was admitted under Dr. Gull with cerebral symptoms from which three days later he died. At the autopsy miliary tubercles were found in the meninges, lungs, liver, and spleen. The kidneys contained caseous tubercles, and the pelvis and ureter on the right side were ulcerated. See 'Insp.' 1863, No. 52.

Guy's Hosp. Museum, 1782.

349. A bladder showing at the upper part of its posterior wall in the median line a distinct oval ulcer one third of an inch in its longest diameter.

Around the orifice of the left ureter is an irregular area of superficial ulceration. On the reverse of the specimen the ureter is seen to be thickened by a deposit which has the histological characters of caseous tubercle.

Reuben B., æt. 10, was admitted under Mr. Symonds for hip disease. Eight months after admission amputation was performed, and the patient died about twenty-four hours later. At the autopsy the spleen, liver, and kidneys were found to be lardaceous, and there was tuberculosis of the lungs and left kidney. See 'Insp.,' 1884, No. 96.

Guy's Hosp. Museum, 1784.

350. A urinary bladder everted, showing numerous tuberculous ulcers. They vary in size from minute points to ulcers a quarter of an inch in diameter. They are circular, shallow, with cleanly cut edges, and are most numerous at the base and lower part of the posterior wall. Miliary tubercles are also scattered throughout the submucous tissue.

From a man who died with tuberculosis of the entire genito-urinary tract. The symptoms had existed seven years. See 'Trans. Path. Soc.,' vol. xxxvii, p. 309, 1886. Presented by E. Hurry Fenwick, Esq., 1885.

R.C.S. Museum, 3677B.

Tuberculosis of the Prostate.

351. A bladder, with the prostate and urethra laid open to show the prostate somewhat enlarged and infiltrated with caseous deposit, which in parts has softened so as to form small cavities. The mucous membrane of the urethra is eroded by ulceration, and beneath it are seen miliary tubercles. On the reverse of the specimen the vesiculæ seminales are seen to be enlarged by caseous deposit.

Cornelius D., æt. 40, was admitted under Dr. Birkett with a perinæal abscess, which was opened and caused a urinary fistula. Five months later he died, and at the autopsy tuberculosis of the vertebræ, lungs, testes, kidneys, and intestines was found. See 'Insp.,' 1873, No. 137.

Guy's Hosp. Museum, 2033.

352. A transverse section through a prostate gland which is enlarged so as to measure an inch and three quarters in diameter. The gland and the vesiculæ seminales are infiltrated by a uniform caseous deposit, which in the centre of the prostate has softened so as to produce a small irregular cavity. Histological examination shows the organ to be affected by caseating tubercle.

John H., æt. 44, was admitted under Mr. Jacobson with tuberculous disease of the right epididymis associated with phthisis. The testicle was removed, and the patient died about four weeks later from his pulmonary disease. At the autopsy there was tuberculous ulceration of the large and small intestine, and the right vas deferens was caseous. See 'Insp.,' 1892, No. 3.

Guy's Hosp. Museum, 2034.

353. Sections of a prostate gland from a young man, with round circumscribed masses of caseous matter deposited in it. There were tubercles in the lungs and other organs.

St. Bart.'s Hosp. Museum, 2846.

354. A prostate gland, of which nearly the whole substance has been destroyed by tuberculous ulceration. Only a thin shell of the gland remains surrounding a cavity with irregular walls, which was traversed by some cords of the indurated tissue of the gland infiltrated with caseous matter, and which contained pus and detached portions of the gland. The cavity communicated by a wide orifice with the urethra.

The patient was an old man who had tuberculous disease of the lungs, kidneys, testicles, and other organs. He died with inflammation of the bladder.

St. Bart.'s Hosp. Museum, 2848.

Tuberculosis of Penis.

355. Section of a penis, in which tuberculous matter is infiltrated through the whole of the corpus cavernosum. On a small separated portion the fibrous covering has been reflected to show that it is unaltered. The cavity of the vena dorsalis penis is filled with tuberculous matter. The corpus spongiosum and urethra are sound. The kidneys were affected with tuberculous disease.

St. Bart.'s Hosp. Museum, 2887.

Tuberculosis of Vesicula Seminalis.

356. The base of a bladder, seen from behind, mounted to show the right vesicula seminalis infiltrated with a yellow softening deposit and enlarged so as to be about four times the size of its fellow. Histologically the deposit is seen to consist of caseating tubercle with giant-cells.

William N., æt. 58, was admitted under Dr. Rees with symptoms of nephritis, and died eight months later. At the autopsy the kidneys, testes, and prostate were found to be affected with caseating tubercle, and there was miliary tuberculosis of the lungs and liver. See 'Insp.,' 1857, No. 105.

Guy's Hosp. Museum, 2068.

357. The base of a bladder with the prostate, seen from behind. A section has been made through the prostate and vesiculæ seminales to show them to be infiltrated with caseous tubercle, the disease being most advanced in the right vesicula. The left ureter is dilated, and the right is thickened from tuberculous deposit beneath its mucous membrane. On the reverse of the specimen the interior of the bladder is seen to be eroded by ulceration.

James C., æt. 45, was admitted under Mr. Lane for hæmaturia, from which he had suffered at intervals for two years. Eleven days later he died, and at the autopsy tuberculous deposit was found in the lungs, intestines, and right kidney. The left kidney was in a condition of pyelo-nephritis. See 'Insp.,' 1890, No. 370.

Guy's Hosp. Museum, 2070.

358. Two specimens of vesiculæ seminales, enlarged, indurated, and having deposits of caseous material upon their lining membranes.

St. Bart.'s Hosp. Museum, 2827.

EPIDIDYMIS—TESTIS—SCROTUM.

359. A left testis, epididymis, and cord injected and bisected. The testis presents healthy tubular structure. The epididymis is much thickened by numerous small nodules of firm tuberculous matter. The vas deferens is similarly thickened.

The patient, Albert B., æt. 45, was admitted into the hospital with strumous disease of the ankle-joint two years ago. The leg was amputated, and on his recovery from the operation the right testis was found diseased, and it was removed. On September 3rd, 1888, he returned with recurrence in the left testis. Presented by Mr. Mansell-Moullin.

London Hosp. Museum, 1993.

360. A sagittal section of an enlarged testicle the blood-vessels of which have been injected. Isolated masses of tubercle are imbedded in healthy structure. More numerous towards the rete testis, where they coalesce to form close-set yellow lines. Suppuration has occurred in the upper part of the epididymis, while a mass of caseous matter occupies the lower part. Described and figured in 'Curling on the Testis.'

London Hosp. Museum, 1996.

361. A sagittal section of a testicle and epididymis. The testicle is but little enlarged, and the tubes are the seat of tuberculous deposit. The epididymis is very much enlarged from tuberculous deposit, softened at many points.

London Hosp. Museum, 1998.

362. A sagittal section of a testicle, the body of which, slightly enlarged, contains numerous masses of pale homogeneous tuberculous matter. Some are small and isolated; but others are large and lobulated, as if formed by the coalescence of smaller masses. The epididymis, much enlarged, is occupied to a great extent by similar deposits. The specimen has been injected, which marks off very distinctly the sound from the tuberculous substance. The patient died of phthisis.

London Hosp. Museum, 2003.

363. An enlarged fungating testis bisected. The testis is three times the normal size and presents but faint trace of tubular structure; almost everywhere it consists of homogeneous caseous material. At the lower part is a small abscess-cavity with irregular walls. The epididymis is also in the same condition. The outer surface of the testis is nodular. The tunica vaginalis has been laid open; its walls are much thickened by infiltration of similar caseous matter, especially at the lower and back part.

London Hosp. Museum, 2009.

364. Testicle removed from a boy, showing in the epididymis (behind) numerous tuberculous nodules and patches, with a few tubercles in the substance of the testicle.
365. Shows the vesiculæ seminales removed by perineal section from the same patient. The termination of the vas, the vesiculæ seminales, and common ejaculatory duct are seen to be tuberculous. Mr. Mansell-Moullin, November, 1900.
London Hosp. Museum, 1993A, 1993B.
366. The specimen was removed by operation from a young child. The epididymis is greatly diseased, the body of the testis being practically unaffected. Four typical caseating nodules replace the diseased epididymis. A ragged, breaking-down mass occupies the lower portion of the specimen, where the growth during life had fungated through the scrotum. See 'Male Surgical Register,' vol. iii (1892), No. 890.
St. Bart.'s Hosp. Museum, 2774E.
367. Section of a tuberculous right testis and cord. There is a large deposit of caseous material in the globus minor, and a few small foci in the globus major. The body of the epididymis and the cord are thickened and highly vascular. The testis itself is moderately enlarged, but contains no obvious tuberculous deposit.
Removed by operation from a man æt. 38. Pain and swelling commenced in the right testis a month before its removal. Six years previously the left testis was removed for tuberculous disease, at Guy's Hospital. See 'Histological Records,' xxxvi, 2774g; and 'Male Surgical Register,' vol. iv (1899), No. 2452.
St. Bart.'s Hosp. Museum, 2774G.
368. Section of a tuberculous testis and spermatic cord. The epididymis and cord are considerably enlarged, and contain extensive deposits of pale yellow caseous material. A portion of the skin of the scrotum is adherent to a point adjacent to a large caseous mass in the body of the epididymis. The body of the testis is not enlarged; it shows commencing extension of the disease from the epididymis into its upper and posterior part.
Removed by operation from a man æt. 22, who four years previously had received a severe blow on the left testicle. The testicle remained enlarged, but was painless till three months before its removal. There was no evidence of tubercle elsewhere in the patient, nor had he any family history of the disease. See 'Histological Records,' xxxvi, 2774h; and 'Male Surgical Register,' vol. iii (1900), No. 53.
St. Bart.'s Hosp. Museum, 2774H.
369. A testis affected by tuberculous disease. It has been laid open, and shows two caseous nodules, one above and one below, which are just beginning to break down. In the middle of the organ is an area which is studded

with large grey semi-translucent tubercles. The epididymis contains numerous tubercles, which are beginning to caseate.

From a man *æt.* 43, who died of general tuberculosis, which was probably secondary to the testicular lesion. The prostate and vesiculæ seminales were extensively affected, as were also both supra-renals. See 'Medical Post-mortem Register,' vol. xxv (1898), p. 127; and 'Male Medical Register,' vol. i (1898), No. 112.

St. Bart.'s Hosp. Museum, 2774F.

370. A testis and the epididymis. The specimen has been cut through longitudinally from behind. The globus major of the epididymis is much enlarged, and has been converted into a hard, calcareous mass, containing several small cysts. The body of the testis appears healthy, though the cord is somewhat thickened. The change in the epididymis is probably the result of old tuberculous inflammation.

St. Bart.'s Hosp. Museum, 2782A.

371. The testicle divided into two parts by a median incision. Outside at the bottom of one half is seen the opening of a sinus leading to the lower end of the epididymis. The vas ascending behind is slightly thickened, and caseous on section. The section of the testicle shows the tunica vaginalis distended by a fibrinous mass, behind which lie the body and globus major of nearly equal size, and below the body the globus minor. Both portions of the epididymis show numerous caseous masses, separated by fibrous bands. The body shows, posteriorly, innumerable opaque yellow masses invading it from the mediastinum, which become few and scattered towards the front of the body.

Removed from a young man who had suffered from gonorrhœa two or three years before, leading to abscess in the globus minor. The sinus did not close.

Charing Cross Hosp. Museum, 1543.

372. A testicle vertically bisected showing enlargement of the epididymis from tuberculous disease, and the sac of the tunica vaginalis distended to form a hydrocele.

Charing Cross Hosp. Museum, 1543A.

373. Half of a testicle with a distended tunica vaginalis and an oval adherent piece of skin. The epididymis is greatly enlarged and caseous as a result of tuberculous disease. This has not extended through the mediastinum to the body to any large extent. A few small yellow nodules can be seen at the lower end of the specimen. The tunica is somewhat thickened, and its inner surface is finely granular. A fistulous tract leads from skin of scrotum to the softening epididymis.

History.—G. R., *æt.* 45. Right testicle enlarged in June, 1892. Abscess burst, August, 1892. Castration, August, 1892. Mr. Boyd's Case-books, 1892.

Charing Cross Hosp. Museum, 1544.

374. One half of a testicle bisected—natural colours preserved—showing great enlargement of epididymis from tuberculous disease. The chief enlargement is in globus minor. At one point the caseous material has undergone softening. The vas deferens is markedly thickened. The body of the testis shows no obvious change. Presented by Mr. Bloxam, 1898.
Charing Cross Hosp. Museum, 1547.
375. A similar specimen showing enlargement and caseation of globus minor and body of epididymis, with tunica thickened and adherent to globus minor. Presented by Mr. Wallis (1898).
Charing Cross Hosp. Museum, 1548.
376. A testicle vertically bisected, with vas deferens showing early tuberculous disease of the epididymis limited to the globus minor and globus major. The former shows on its cut surface a yellow mass of caseous tubercle, nodular. The body of the epididymis is not affected with thickening of the vas at its commencement. Presented by Mr. Morgan (1898).
Charing Cross Hospital Museum, 1549.
377. One half of a testicle, with vas deferens—natural colours preserved—showing extensive disease of epididymis, with softening of caseous material in globus major and globus minor, with formation of a sinus between the latter and the skin of the scrotum.
Charing Cross Hosp. Museum, 1550.
378. One half of a testicle, with portion of skin of scrotum adherent to the globus major. The body of testis enlarged, and studded with miliary and caseous tuberculous nodules. Presented by Mr. Boyd (1897).
Charing Cross Hosp. Museum, 1551.
379. A testicle vertically bisected, with vas—natural colours preserved—showing great enlargement of epididymis from tuberculous disease. The epididymis forms a thickened mass behind the testis, of a yellow colour, and shows on its cut surface a yellow mass of caseous tubercle, both in globus major and minor; as also deposit of the tubercle in the individual tubules of body of epididymis. From the globus major the yellow caseating tubercle extends into the upper and back part of the body of the testis.
Charing Cross Hosp. Museum, 1552.
380. Half of a testicle—natural colour preserved—showing very extensive caseation and softening of the epididymis, and the body of the testis studded with isolated greyish caseating tubercles. Presented by Mr. Waterhouse (1899).
Charing Cross Hosp. Museum, 1553.

381. One half of a right testicle—natural colours preserved—showing marked tuberculous disease of epididymis, with softening and sinus; and also of body of testis; only a narrow strip of normal testicular tissue can be seen.

Removed by operation from a youth, who died soon after from extensive tuberculous disease. The vas deferens and vesicula seminalis of right side were tuberculous (see next specimen); also the mesenteric glands. Presented by Mr. Bloxam (1899).

Charing Cross Hosp. Museum, 1552A.

382. Prostate with vasa deferentia and vesiculæ seminales, from the preceding case of tuberculous disease of testis. On the right side the vas deferens and seminal vesicle are markedly tuberculous, enlarged and caseous.

Charing Cross Hosp. Museum, 1555.

383. Testicle with part of scrotum, to which it has become adherent. The substance of the gland has protruded through an opening in its coverings and the skin. The exposed portion is covered with granulations, and is somewhat rounded in form.

The patient, a butcher, æt. 33, was admitted with a fungating mass protruding from the right side of the scrotum. There was also a sinus leading down to the left epididymis. No phthisical history, but patient looked tuberculous. The testicle had a blow three years before, up to which time it had always been healthy. Treated with embrocation, and ten months later the skin broke and a discharge set in. Both cords rather swollen, and vasa deferentia a little enlarged, but not nodular. Patient had testicular feeling on left side. Vesiculæ seminales normal. Right testicle was removed. The disease was thought to be syphilis. On section tumour consisted of a firm fibrous mass, capped with granulations. There was no caseation anywhere. The vas seemed quite normal, a little thick below, but nowhere nodular. Mr. Morgan's Case-book, 1891.

Charing Cross Hosp. Museum, 1554.

384. A testicle and epididymis divided sagittally. The body of the testicle shows numerous grey granulations scattered through its substance, and a few caseous tubercles. The epididymis is enlarged and shows caseous tubercles, some of which are softening. There are a few adhesions between the layers of the tunica vaginalis. 'Post-mortem,' 287; 'Med. Reg.,' 1330, 1897.

Middlesex Hosp. Museum.

385. The specimen shows considerable enlargement of the organ, the enlargement chiefly affecting the epididymis. The latter is almost entirely converted into one large cheesy mass, while similar but smaller masses are seen in the body of the testicle, as well as numerous more recent tubercles.

From a man æt. 48, who suffered from chronic pulmonary tuberculosis. In addition to tuberculosis of the testicle, both vesiculæ seminales, the bladder, and the prostate all showed tuberculous disease.

Brompton Hosp. Museum, N. 237.

386. A vertical section of a testicle, the globus minor of which is the seat of advanced tuberculous disease, having been destroyed in an abscess of which the contents have been rendered solid by means of formalin. The coverings of the testicle and skin are adherent at the site of the abscess mentioned, which has extended beyond the proper globus minor into the coverings. The vas deferens, into which a black bristle has been inserted, is not yet affected.

From a man æt. 28, a horsekeeper, who had noticed a painless swelling of the right testicle for about twelve months, at the end of which time an abscess burst, and was followed by a discharging sinus. There was no family history of phthisis. The vesicula seminalis of the same side was felt to be enlarged and nodular on rectal examination. The other testicle and the lungs were normal. Castration was carried out, January, 1900. Presented by E. C. Stabb, Esq., 1901.

R.C.S. Museum, 4913A.

387. Cavity of a large scrofulous abscess in the testicle. The internal surface of this cavity is still lined by a thick layer of scrofulous matter. When a section of this preparation was first made a large quantity of pus escaped. The remains of the testis are situated at the lower part of the preparation; the two layers of the tunica vaginalis are firmly united to each other. The disease had existed for many years, but its nature was not ascertained. The patient died of effusion of urine, the result of false passages produced by the passing of instruments for stricture.

St. George's Hosp. Museum, Series XIII, 33K.

388. A right testis with the portion of the scrotum in contact with its lower extremity. There is a sinus in the scrotum communicating with a caseous abscess at the lower end of the epididymis. The epididymis itself is fibro-caseous.

William H. was admitted under Mr. Morgan in 1831 for retention of urine, and died from pyæmia. See 'Insp.,' vol. xv, p. 118.

Guy's Hosp. Museum, 2173.

Tuberculous Ulcer of Scrotum.

389. Portion of a scrotum exhibiting a tuberculous ulcer in the skin. The edge of the ulcer is much thickened and undermined, while the surrounding integument where infiltrated is devoid of wrinkles and less pigmented than normal

From a man æt. 28. Two and a half months previously both testicles had been removed for tuberculosis and hernia testis. The wound healed satisfactorily, but two months after the operation the disease recurred in the scrotum and rapidly ulcerated. Presented by T. Bryant, Esq., 1897.

R.C.S. Museum, A 4301.

TUBERCULOSIS OF THE OVARIES, FALLOPIAN TUBES, UTERUS, VAGINA, PELVIC PERITONEUM, AND MAMMARY GLAND.

The following series of specimens has been arranged by Mr. J. H. TARGETT.

Acute Tuberculous Salpingitis.

390. The distal end of the right tube is enlarged, and its lumen is entirely filled by swelling of the mucous membrane. Histologically the mucosa is thickly infiltrated with miliary tubercles.

From a woman æt. 22, who was taken suddenly ill with severe abdominal pain and sickness, rigors, pyrexia, and signs of peritonitis in the right iliac region. The case was regarded as appendicitis, but on abdominal section the appendix was found to be healthy. The right uterine appendages were swollen, and there was acute injection of the adjacent peritoneum. A speedy recovery ensued.

Guy's Hosp. Museum.

Tuberculous Salpingitis—Caseous Stage.

391. The specimen shows the uterus, ovaries, and Fallopian tubes. The right tube is somewhat swollen, and is found on section to be in an early stage of tuberculous infiltration. The mucous membrane is swollen, and caseous material fills the lumen of the tube. On the left side the condition is similar but more advanced. The tube is considerably enlarged, reddened and tortuous, and on section shows marked caseous degeneration of the mucous membrane, and occlusion of the lumen with caseous *débris*. The peritoneum in the neighbourhood of the Fallopian tubes showed a few recent tubercles, but was otherwise unaffected. The uterus and ovaries are normal.

From a girl æt. 14, who suffered from chronic pulmonary tuberculosis, and tuberculous disease of the trachea and intestines. Both kidneys also showed early tubercle.

Brompton Hosp. Museum, 163.

Acute Tuberculous Salpingitis with Hæmatosalpinx.

392. The outer half of the tube is considerably enlarged, and its lumen uniformly dilated. The abdominal ostium is closed by adhesions, but traces of the fimbriæ can be discerned on the exterior. A section across the dilated portion of the tube shows marked thickening and rugosity of the mucous coat, and in the recent state the tube was filled with blood.

Histologically the mucous membrane is infiltrated with miliary tubercles, but its epithelial covering is for the most part preserved.

From a woman æt. 29, who complained of constant pelvic pain and dysuria, but was otherwise in good health. Menstruation normal. There was a swelling in the site of the right appendages, but no enlargement of the uterus. This specimen was successfully removed by abdominal section.

Lent by Dr. Macnaughton-Jones.

Tuberculous Salpingitis—Caseous Stage.

393. Two specimens of tuberculous disease of the Fallopian tubes. In the upper specimen the right ovary, with its Fallopian tube and broad ligament, is alone preserved. The Fallopian tube is greatly thickened and enlarged for the outer three quarters of its extent, and is filled with a caseating material. The ovary contains two well-marked blood-cysts.

From a woman æt. 22, who had symptoms of advanced pulmonary phthisis, with tuberculous ulceration of the bowels.

In the lower specimen the uterus and its appendages are preserved. The Fallopian tubes are greatly distended and filled with fine caseating material, except at their fimbriated extremities, which are filled with a thick cheesy pus. The uterus is healthy.

From a woman æt. 19, who died of pulmonary phthisis. Sections of the Fallopian tubes showed tubercle bacilli.

St. Bart.'s Hosp. Museum, 2938a.

Tuberculous Salpingitis and Perimetritis.

394. A Fallopian tube and broad ligament (natural colours preserved) showing the effects of long-standing inflammation. The structures are all matted together, and the tube is extensively thickened, tortuous, and coiled on itself. Its distal part is converted into an abscess with acutely inflamed suppurating walls.

From Mrs. S., æt. 27. She had dropsy (? tuberculous peritonitis) for two years. Gonorrhœa, contracted on marriage, caused matting of the pelvic viscera and swelling of the appendages. This subsided under treatment, but returned later, and was accompanied by high fever. The uterus was retroverted; the left tube was behind it in Douglas's pouch, and the right tube was above, and could be felt in the groin. Both tubes were successfully removed; each was the size of a small fist, thin-walled, and full of pus. A cheesy pea-sized nodule was removed from top of uterus.

Charing Cross Hosp. Museum 1627, 1627a.

Suppurating Tuberculous Salpingitis.

395. A vagina, uterus, and its appendages seen from behind. On either side of the fundus of the uterus there is a thick-walled cyst about two inches in diameter, which has resulted from dilatation of the corresponding Fallopian tube. The lining membrane of the left cyst forms thick rugæ closely

packed together ; on the opposite side it has been destroyed over a large area. Bristles indicate the communication of the uterine cavity with the cysts. There is much inflammatory tissue around the body and neck of the uterus, and the peritoneal surface of the bladder and uterine appendages is covered with fibrous adhesions. Histologically the wall of the left cyst is composed of fibro-muscular tissue, in which large tubercles are found. Its rugose lining membrane chiefly consists of caseous material, but scattered groups of small round-cells may be recognised in it.

From a girl æt. 19, who, three years before her death, was admitted to a hospital with a soft fluctuating swelling in the lower part of the abdominal cavity, for which an exploratory operation was performed. Shortly afterwards there was a profuse discharge from the vagina, and the swelling diminished, But the patient became weak and emaciated, and gradually sank. The autopsy revealed extensive tuberculous disease of the lungs and peritoneum.

R.C.S. Museum, 4566a.

Double Tuberculous Pyosalpinx.

396. The specimen consists of two enormously dilated Fallopian tubes, which are firmly united at their broader ends, where a communication has formed between them. The lower sac is the left tube distended into a pyriform cyst seven inches in length, and its interior shows much ulceration of the lining membrane. This tube filled Douglas's pouch, while the upper or right pyosalpinx was rotated over to the left side of the abdomen. In the recent state the united tubes contained three pints four ounces of thin pus, which was sterile. Histological examination of the undilated uterine end of the pyosalpinx revealed abundant evidence of tuberculous salpingitis.

From a woman æt. 29, married nine years but never pregnant. She had a severe illness with great abdominal pain five years ago, but no swelling was noticed in the abdomen until some two years later. Menstruation regular, but painful. On admission the abdomen was occupied by a fluctuating tumour, which reached a hand's breadth above the umbilicus, and bulged into Douglas's pouch, pushing the uterus forwards. The tumour was successfully removed by abdominal section.

Guy's Hosp. Museum.

Acute Tuberculosis of Uterus.

397. The uterus is enlarged, and its wall is much hypertrophied. The lining membrane of the body is greatly thickened, and thrown into large rugæ. A similar thickening has extended along the canal of the cervix. Histologically the endometrium is infiltrated with miliary tubercles and foci of early caseation.

From a woman æt. 35, who suffered from sanguineous vaginal discharge and the clinical symptoms of malignant disease.

Guy's Hosp. Museum, 2261⁷⁰.

Tuberculous Endometritis.

398. Section of uterus showing tuberculosis of endometrium. The mucous membrane of the cervix and vagina is healthy, but that of the body of the uterus is thickened, ulcerated, and infiltrated with numerous small tubercles, some of which are caseous. The lymphatic glands in the broad ligament are enlarged and caseous. From a woman who died of phthisis.

London Hosp. Museum, 141A.

Tuberculous Ulceration of Uterus and Appendages.

399. The specimen shows the upper two thirds of the cavity of the uterus to be covered with irregular caseous masses. In places the uterine wall is infiltrated for about one sixteenth of an inch. The tuberculous disease extends into the left Fallopian tube, which is enlarged and caseous. The free end forms a globular cyst, which was full of caseous pus, and is adherent to the left ovary. The latter forms a thin-walled cyst the size of a small orange, and is lined with caseous matter. It was full of pus. The right Fallopian tube is also affected with tuberculous disease. It commences to be caseous about one inch from its uterine end, and suddenly expands into a long cyst about two inches in length. It is not adherent to the right ovary, which is healthy.

From a woman æt. 26, who suffered from chronic pulmonary tuberculosis and left pyo-pneumothorax. The larynx and intestines also showed signs of tuberculous ulceration.

Brompton Hosp. Museum, 185.

Tubercle of Body of Uterus.

400. The body of the uterus has been laid open to show an irregular ulceration of the whole cavity extending along the cervix, but ceasing before it reaches the os externum. The lining membrane of the vagina retains a natural appearance. Microscopically, the wall of the uterus shows abundant evidence of tubercle, with caseous changes and characteristic giant-cells.

St. Bart.'s Hosp. Museum, 3004.

Tubercle of the Uterus and Fallopian Tubes.

401. The lining membrane of the uterus shows caseous infiltration and thickening, with some irregular ulceration. The uterine cavity is dilated, and was filled with a slightly gelatinous curdy fluid. The cervical canal is free from disease. The left Fallopian tube is thickened, and caseous nodules occur in its wall. Microscopical examination of the caseous lining of the uterus showed the presence of a small number of tubercle bacilli.

From a girl æt. 14, who had never menstruated. She suffered from phthisis, tuberculous meningitis, and chronic peritonitis, but was only ill for three

months. At the autopsy no tubercles were found in connection with the peritoneum.

St. Bart.'s Hosp. Museum, 3015*d*.

Tuberculous Pyometra.

402. The specimen shows the uterus to be distinctly enlarged, its mucous surface highly irregular and eroded. The cavity of the uterus when first opened was found to be filled with caseous broken-down *débris*, in which innumerable tubercle bacilli were found. Both Fallopian tubes showed evidences of old, probably tuberculous, disease. The peritoneum around was adherent, but no tubercles were found on it. The bladder was natural.

From a woman æt. 36, who suffered from chronic pulmonary tuberculosis and tuberculous laryngitis.

Brompton Hosp. Museum, 110.

Tuberculous Ulceration of Vagina.

403. The mucous membrane of the vagina is extensively affected with small punctate ulcers, having a slightly raised edge and a deeply excavated centre. There is old tuberculous salpingitis and endometritis.

From a woman æt. 25, who died of phthisis.

Guy's Hosp. Museum, 2261⁷⁶.

Chronic Tuberculous Pelvic Peritonitis.

404. The uterus and its appendages are plastered over with a thick layer of exudation, so that the utero-vesical pouch is entirely obliterated. The fimbriated extremities of the tubes persist as conspicuous objects on the lateral wall of the pelvis. There is a hernia of the left tube into an inguinal sac. The interior of the uterus shows well-marked tuberculous ulceration.

From a female lunatic æt. 39, who died of advanced tuberculosis of the lungs and peritoneum.

R.C.S. Museum.

Tuberculous Abscess of Breast.

405. One half of a mammary gland removed by operation on account of a large cystic swelling situated in the deepest part of the breast. It was found to contain pus, and its walls are ragged and covered with a fine velvety deposit.

From a woman æt. 60. Some of the axillary glands were enlarged, and were removed at the same time. These were examined and found to contain tubercle bacilli, but no bacilli were found in the pus from the abscess cavity.

St. Bart.'s Hosp. Museum, 3144*a*.

406. A breast greatly enlarged from chronic interstitial inflammation. It has a diameter of six inches, and at its centre is an inch in thickness. Its anterior surface is nearly everywhere covered with small projecting outgrowths of the gland. At one spot exposed in the lesser incision there was evident in the recent state a small mass of caseous tissue, which microscopic examination showed to be tuberculous.

E. S., æt. 40, admitted December, 1891, under the care of Mr. Pitts. Her father and mother both died of consumption. Eighteen months before coming under notice she sustained a squeeze of the left breast, but, except for a little temporary pain, she noticed nothing further. About four months before admission the breast became painful, and there was a distinct lump to be felt. When admitted there was a thickening about the size of half a crown in the substance of the breast; its edge was not well defined, and the skin over it was distinctly dimpled. The axillary glands were enlarged on the corresponding side. The remainder of the gland was more evident than normal, but soft. Considerable tenderness ensued on pressure of the lump, which subsequent microscopical examination showed to be distinctly tuberculous. It is uncertain whether the tuberculous lesion in this case was secondarily implanted on a previous chronic mastitis leading to general enlargement, or whether it was the primary one. H. B. Robinson, Esq., 'Brit. Med. Journ.,' June 11th, 1892.

St. Thomas's Hosp. Museum, 2510A.

407. Portion of a breast with some of the axillary lymphatic glands. In the breast is the cavity of a chronic abscess about three quarters of an inch in diameter, the wall of which, formed by fungating granulation tissue, presents microscopically the histological character of tuberculosis. The cavities in the upper of the enlarged glands were filled with caseous substance.

R. F., æt. 21, admitted under Mr. Mackellar. Parents alive and in good health. There is no history of tuberculosis in the family. Six years before admission she first noticed a lump in the left breast the size of a hazel nut. It has been now and again painful for the past few months, especially after exertion and at night. About twelve months ago glandular enlargement was noticed in the axilla. On admission a swelling was present at the upper and outer angle of the left mamma, close to the inferior border of the pectoralis. It was moveable on the subjacent parts; the skin over it was not reddened, and dimpled on being raised. It appeared to be connected through the medium of a hard cord with an enlarged gland in the axilla. No fluctuation was detectable. An incision was made about three inches in length from over the tumour up into the axilla, and the swelling excised *in situ*; this proved to be an abscess, which contained a small quantity of thick pus. The portion of the breast was then excised, together with several enlarged axillary glands. S. G. Shattock, Esq., 'Path. Soc. Trans.,' vol. xl, p. 391.

St. Thomas's Hosp. Museum, 2511.

TUBERCULOSIS OF THE EYE.

Tubercle of the Choroid.

408. The posterior half of an eye. The retina has been removed so that the choroid coat is shown, and to one side of the disc a typical tubercle is seen. The specimen was obtained from an infant æt. 7 months, who

died with general tuberculosis. See 'Medical Post-mortem Register,' vol. xxiii (1896), p. 52.

St. Bart.'s Hosp. Museum, 2621B.

409. Section through an eye removed from a girl æt. 16 years. It is occupied by a growth thought during life to be a pseudo-glioma, which, on microscopical examination, however, turned out to be tuberculous.

There was a strong tuberculous history. The eye was enucleated on March 13th, 1896, and early in April she had undoubted signs and symptoms of meningitis, of which she died. After death the examination revealed tuberculous meningitis and multiple tubercles in the lungs. See 'Ophthalmic Ward Notes' (1896), No. 507.

St. Bart.'s Hosp. Museum, 2621C.

410. The posterior half of an eye of a girl æt. 5, who died with general tuberculosis (tuberculous meningitis, tuberculosis of lungs, liver, spleen, etc.). The eye has been everted, and shows numerous miliary tubercles; the choroid pigment has been brushed away. See 'Medical Post-mortem Register,' vol. xxiii (1896), p. 339; and 'Female Medical Register,' vol. v (1896), No. 152.

St. Bart.'s Hosp. Museum, 2621D.

411. The posterior half of the globe, showing miliary tubercles in the choroid.

The eye was removed from a man æt. 40, under the care of Dr Ramskill, admitted for acute tuberculosis. At the post-mortem on May 29th, 1871, immense numbers of miliary tubercles were found in the lungs, kidneys, peritoneum, tuniæ vaginales, and a few in the pia mater at the base of the brain. The patient had not complained of amblyopia during life, so the ophthalmoscope was not used.

London Hosp. Museum, 917.

412. The posterior half of the globe, showing miliary tubercles in the choroid.

London Hosp. Museum, 917A.

413. The posterior half of the globe, showing miliary tubercles in the choroid.

London Hosp. Museum, 917B.

Orbital Tuberculosis.

414. Section through a mass removed from the orbit (from the region of the lachrymal gland, which had been destroyed by the growth) of a young man æt. 18. The growth when fresh was distinctly caseous, and microscopically also undoubtedly tuberculous, although Koch's bacillus was not discovered in stained sections. Six months previous to the operation a small lump appeared in the right upper lid, which gradually increased to the size of a walnut, displacing the eye downwards. There were signs of tuberculosis of the lungs, and also enlarged glands, and scars in the neck. See 'Ophthalmic Ward Book' (1896), No. 3102.

St. Bart.'s Hosp. Museum, 2570L.

TUBERCULOSIS OF THE EAR.

415. The right temporal bone of a child *æt.* 13 months, showing destruction of the ear by tuberculosis. The membrana tympani has been completely destroyed by disease, the ossicles have perished, and the middle ear is disorganised. In the recent state the antrum as well as the middle ear was occupied by *débris* and caseous matter. The cancellous tissue of the mastoid is also involved, but there is no evidence to show that the disease commenced in this region.

On the outer aspect of the bone the soft parts have been deflected to expose necrosis immediately above and behind the external auditory meatus. The area of bone necrosed is sharply defined; it is of about the size of a sixpence, and corresponds to the outer wall of the antrum. The external evidence of implication of this portion of the bone was insignificant of the degree of necrosis. On the inner aspect the dura mater lining the middle fossa has been deflected. On the extra-dural surface of this membrane some tuberculous deposits can be seen; an extra-dural abscess was situated immediately over the point of communication of the petro-squamosal sinus with the middle ear.

The tuberculous nature of the disease was definitely established by tubercle bacilli being found in the tissues over the necrosed bone.

A section is exhibited in the microscopic collection.

The child had been wasting for seven months, had had measles two months previously, and a cough of three months' duration. It was stated that the discharge had been noticed from the right ear for about four months, and that the left had also suffered. No mention was made of hæmorrhage from the ear. Fifteen days before death facial paralysis developed, and the child died with symptoms pointing to cerebral disease.

The post-mortem examination revealed extensive disease of the lymphatic glands, general miliary tuberculosis, tuberculous meningitis, together with tuberculous nodules in the brain. The lymphatic glands enlarged on the right side were the pre-auricular, the submaxillary, the supraclavicular, and the deep cervical, and on the left, those under the angle of the jaw to a less degree. The tracheal and bronchial glands were very large and infiltrated, and some of these were liquid in the centre. The mesenteric and the glands in the hilum of the liver were also tuberculous. The brain contained three tuberculous masses of the size of small marbles, which were situated (1) in the lateral ventricle on the left side in the posterior and internal part of the optic thalamus; (2) in the posterior lateral part of the right lateral lobe of the cerebellum; (3) in the posterior lateral part of the left lateral lobe of the cerebellum. There was little thickening of the pia and arachnoid membranes at the base, but well-defined tubercles could be seen along the Sylvian fissures, and on the lateral aspects of the convolutions above the corpus callosum. The thoracic and abdominal viscera showed general miliary tuberculosis.

Lent by W. Jobson Horne, M.D.

TUBERCULOSIS OF THE INTEGUMENTARY SYSTEM.

DRAWINGS, PHOTOGRAPHS, AND PREPARATIONS ILLUSTRATING TUBERCULOSIS OF THE SKIN.

Tuberculosis when it affects the skin assumes a multitude of phases which have been known as *true tuberculosis of the skin*, *lupus vulgaris*, and *scrofuloderma*, and to these of late years certain multiple, localised, or more or less generalised eruptions have been added, and known tentatively as "*Tuberculides*."

416. *True tuberculous ulcer* of the lip secondary to phthisis. Similar ulcers may be met with at the anal region.
417. "*Gummatous tuberculous lymphangitis* secondary to tuberculous dactylitis. (Portrait in the 'Atlas' of the Hôpital St. Louis Museum.) This in turn was secondary to Phthisis, but a similar lymphangitis may follow a primary tuberculous inoculation of the finger.

Lupus vulgaris.

418. *Lupus vulgaris* frequently arises in all probability from external inoculation into more or less trivial wounds, into surgical wounds, during the act of tattooing, during the carrying out of the rite of circumcision. It also spreads to the skin from underlying tuberculous lesions, such as the lymphatics, bones, and "cold abscesses." It may extend, or be inoculated from a tuberculous mucous membrane, especially the nose. Lastly, it may arise probably by way of the blood current, and then the lesions tend to be multiple and simultaneous. A patch once formed may bring about the inoculation of additional lesions.

Modes of origin :

419. Portrait showing "apple-jelly" nodules arising secondary to tuberculous lymph glands.
420. Portrait showing nodules secondary to a "cold abscess."
421. Portrait showing exanthematic outburst (?) by blood-current.

Methods of spread by continuity, by local infection and satellites, by auto-inoculation at a distance, by large lymphatics.

Different Phases brought about by Virulence of Organism, Tissue peculiarities, Site, Complicating Pus Organisms, etc.

- 422. Portrait of early patch displaying parent patch and satellites.
- 423. Portraits of the common exfoliative patch on a girl's cheek, and of a patch
- round eye.
- 424. Multiple patches on the face with central scarring. (From Duhring's
'Atlas.')
- 425. Suppurating and encrusted patches.
- 426. Lupus vulgaris ex ulcerans. (The Sydenham Society's plate, and a second
plate.)
- 427. Four portraits of lupus verrucosus of the back of the hand in old people,
and plate setting forth the histology of this variety. (Niehl and Paultauf,)
- 428. Photograph of remarkable case with multiple patches.
- 429. Three photographs.
- 430. Extensive lupus with elephantoid enlargement of the arm.
- 431. Kaposi's plate of Acne necroticans.

Scrofuloderma.

- 432. Photograph of penis and suppurating glanc
- 433. Photograph of breaking-down glands.
- 434. Scrofulo-tuberculous gummata of infants.

"Tuberculides."

- (a) Lichen scrofulosorum.
- (b) Acne scrofulosorum.
- (c) Papular and nodular.
- (d) Erythema induratum.

Lupus Erythematosus.

Lupus.

- 435. Forearm and head showing horrible distortion with foul ulceration of the
hand from lupus. Amputated by Mr. Durham, January, 1868.
Guy's Hosp. Museum, 1310⁵⁰.

436. A portion of a patch of *Lupus vulgaris* from the skin of the thigh. The surface of the affected area is irregular, and considerably elevated above the surrounding skin.

Microscopic examination.—The subcutaneous tissue shows extensive infiltration with small round cells, amongst which giant-cells are scantily present. The epidermis shows inflammatory overgrowth of its inter-papillary processes.

Removed by operation from the thigh of a man æt. 20. Twelve years previously an abscess was incised in the same situation; the wound did not heal, and the eruption appeared to originate and extend therefrom. A second similar patch appeared on the thigh ten years later. The glands in the groin were enlarged. See 'Male Surgical Register,' vol. v (1895), No. 576.

St. Bart.'s Hosp. Museum, 2704B.

437. A piece of the skin of the thigh showing superficial ulceration caused by lupus. The affection commenced after a severe attack of smallpox, and was so extensive as to necessitate amputation above the knee. The leg is preserved in Series I, No. 3233A, to which refer for notes of the case. Presented by Alfred Willett, Esq.

St. Bart.'s Hosp. Museum, 2704A.

438. The lower two thirds of a right leg removed by amputation just above the knee on account of very extreme lupus ulceration of the skin. There is an area of scar tissue, six inches wide, encircling the leg. Dotted irregularly over this are patches of exuberant granulations with an ulcerated surface. These are particularly numerous in the neighbourhood of the inner ankle and inner side of the heel. The limb has been partially injected.

The patient was a lady æt. 68. As a child she suffered from tuberculous disease of the tarsus, from which she quite recovered. In 1870, after an attack of smallpox, a nodule of lupus occurred in the calf of the leg; this gradually spread. Two small patches were scraped in 1889 with good effect, but she refused to allow the whole affected area to be treated in this way. The limb was amputated in March, 1892. Presented by Alfred Willett, Esq.

St. Bart.'s Hosp. Museum, 3233A.

Lupus of Perinæum.

439. A patch of lupus removed by operation from the perinæum of a woman, æt. 40, at the margin of the anus. The thickened nodular margin is well seen. The central scarring and depression is the result of old operative treatment. See 'Female Surgical Register,' vol. v (1898), No. 2700.

St. Bart.'s Hosp. Museum, 3233N.

XV. THE HISTOPATHOLOGY OF TUBERCULOSIS (HUMAN).

By W. JOBSON HORNE, M.D., and ERNEST H. SHAW.

Organs of Locomotion.

1. Section of synovial membrane greatly thickened by a deposit of tubercle ; the tubercles are well marked, and show many giant-cells.
2. Section through the wall of an enlarged bursa from the neighbourhood of the hip joint, showing several tubercles in its substance.

Heart and Blood-vessels.

3. Section of the wall of a heart in which the pericardium is greatly thickened by a deposit of caseous tuberculous material.
4. Transverse section of an artery and several small nerves involved in a mass of tuberculous inflammatory tissue. The artery is almost occluded by a tuberculous mass which has penetrated its walls ; giant-cells and caseation are well shown. The nerve bundles are widely separated, but the tuberculous material has not penetrated the perineurium.

Respiratory System.

5. Tuberculosis of the larynx. A vertical section through the ventricular band and vocal cord in the region of the vocal process. The section is stained with carbol fuchsin and methylene blue, and shows tubercles and tubercle bacilli in the submucosa.
6. Tuberculosis of the larynx. A horizontal section through the inter-arytænoid region, stained in the same way as the preceding one, and showing similar changes.
7. Section of the lung of a child, showing a few very small tubercles ; the larger tubercles are commencing to caseate.
8. Section of the lung of an infant æt. 4 months (same case as No. 26) ; many caseous tubercles are distributed throughout its substance, some in close relation to the terminal bronchioles, others involving the walls of blood-vessels ; the pulmonary tissue around the tubercles is consolidated ; giant-cells are absent.

9. Another section of the same lung, stained with carbol fuchsin and methylene blue ; tubercle bacilli are present in enormous numbers, both in the tubercles themselves and in the inflammatory exudation in the surrounding air vesicles.
10. Section of a lung showing miliary tubercle ; the nodules are collected into groups in close relation with the vessels and terminal bronchioles. The tubercles show a good deal of fibrosis, also caseation, but the most striking feature is the large number of giant-cells present, most of them of large size.
11. Section of a large caseous nodule in the lung ; the remains of lung tissue and tubercles can be made out in the central part of the mass ; around the nodule there are many other more recent tubercles : these are fibroid and beginning to caseate. Large numbers of giant-cells are present.
12. Section through the wall of a small tuberculous cavity in the lung ; the surrounding lung tissue is thickened and pneumonic, and caseating tubercles are present.
13. Section through the wall of a phthisical cavity in the lung ; the wall is very thick and fibrous, and is lined internally by a layer of fibrinous material. The lung tissue generally is very much thickened, as also is the pleura. At one spot there is a dense fibro-caseating nodule deeply pigmented.
14. Section of a lung affected with tuberculous disease accompanied with a good deal of emphysema. The tubercles are for the most part soft and caseous and without giant-cells, but in one or two places rather firmer nodules are to be seen with a few giant-cells.

Digestive System.

15. Section of a tuberculous ulcer of the tongue ; the muscle is extensively infiltrated and destroyed by tubercle. Caseation has not taken place, and there is much inflammatory tissue ; giant-cells are very numerous.
16. Section of a tonsil showing a large number of tubercles throughout its substance ; the tubercles are very well marked, and contain many large multinucleated giant-cells.
17. Vertical section of a tuberculous ulcer of the small intestine ; the thickened overhanging edges and general infiltration of the muscular coats are well shown. The peritoneum lining the base of the ulcer is greatly thickened.
18. Another section of the same ulcer stained to show tubercle bacilli ; they are present in such enormous numbers as to be easily seen with a low power.

19. Transverse section of the small intestine, showing a small tuberculous ulcer; the base and edges of the ulcer exhibit several well-marked tubercles. The peritoneal coat is also involved.
20. Section of a vermiform appendix affected with tuberculous disease; the disease affects only the mucous membrane, which is ulcerated at one spot. Caseation and giant-cells are present. From a case of tuberculous ulceration of the intestines.
21. Another section of the same appendix stained to show the tubercle bacilli, which are present in great numbers.
22. Section of a thickened peritoneum affected with tuberculous disease; there is a good deal of fibrosis.
23. Section of the omentum from a case of tuberculous disease of the peritoneum; it is greatly thickened by a deposit of caseous tubercle.
24. Section of an omentum thickened and showing many tubercles throughout its substance; the tubercles are of the fibrous variety, and show little or no caseation; a few giant-cells may be seen.
25. Section of a liver from a child who died of general miliary tuberculosis; several small tubercles are present—they show very well the characteristic appearance of early tubercle; *i. e.* outer zone of inflammatory cells, within which is the reticulum with endothelioid cells, and one or two branching giant-cells. The largest tubercle also shows commencing caseation. The liver-tissue itself is comparatively normal. (Stained with hæmatein and eosin).
26. Section of the liver of an infant *æt.* 4 months, showing a large number of small caseous tubercles scattered throughout its substance; many of the tubercles are in close relation to the branches of the blood-vessels, and in several instances the masses have actually penetrated the wall and burst through into the lumen of the vessel; giant-cells are absent. The liver is extremely fatty.
27. Another section of the same liver stained with carbol fuchsin and methylene blue. Tubercle bacilli are present in enormous numbers in some of the tuberculous masses.
28. Section of a liver affected with miliary tuberculosis accompanied by a good deal of fatty change. (Stained by osmic acid and alum carmine.)
29. Section of a cirrhotic liver which, in addition, shows fatty changes and tubercle.

Lymphatic Glands.

30. Section of a cervical lymphatic gland; a large number of well-marked caseous tubercles occupy its substance, in some instances forming large areas by coalescence of groups of tubercles. The peripheral parts of the patches show marked fibroid change, and the giant-cells present are very striking.
31. Section of lymphatic gland showing similar changes to the preceding, the fibrosis being well marked. Giant-cells are scanty.
32. Section through three small bronchial lymphatic glands; most of the gland tissue has been replaced by caseous tubercle. The specimen has been stained with carbol fuchsin and methylene blue, and shows large numbers of tubercle bacilli at the periphery of the glands.
33. Sections of the cervical lymphatic glands from the same case also showing large numbers of tubercle bacilli.

Spleen.

34. Section of the spleen from an infant æt. 4 months (same case as Nos. 8 and 26); it is riddled with caseous tuberculous masses, which can be seen to involve the blood-vessels, and are of varying size; giant-cells are absent. The splenic tissue is very much engorged with blood.
35. Another section of the same spleen stained with carbol fuchsin and methylene blue; tubercle bacilli are very plentiful, and so abundant in some of the tubercles as to be seen as large masses with a low power.
36. Section of a tuberculous spleen; the tubercles are very numerous and well marked, and there are many giant-cells.
37. Section of a tuberculous spleen; the tubercles are irregular in shape and size, and all show caseation; giant-cells are absent.

Supra-renal Gland.

38. Section of a supra-renal body from a case of Addison's disease. There are several small tuberculous areas with caseation and giant-cells.
39. Another section of the same supra-renal stained with carbol fuchsin and methylene blue; tubercle bacilli can be seen in the caseous patches.

Genito-urinary System.

40. Section of a kidney in which several tuberculous patches are seen in the cortex; these are mainly composed of round cells; the largest

contain several multinucleated giant-cells; caseation has not commenced; the margins are very ill-defined. From a child who died with general miliary tuberculosis. (Stained with hæmatein and eosin.)

41. Section of a kidney largely infiltrated and destroyed by caseous tuberculous matter; some smaller tubercles are scattered around the main mass.
42. Another section of the same kidney stained with carbol fuchsin and methylene blue, showing numerous tubercle bacilli.
43. Section of a kidney extensively affected with tubercle; large masses of caseous material have replaced the original tissue of the organ; around the edges of these caseous areas are numbers of multinucleated giant-cells; other smaller tubercles surround the main mass. (Stained with hæmatein and eosin.)
44. Section of the wall of the bladder of a child showing several small tubercles in its substance. (Stained with alum carmine.)
45. Section of an epididymis much enlarged by tuberculous disease; the tubercles are well marked and show a certain amount of fibrous change in addition to caseation and giant-cells; the giant-cells are very numerous and large in size.
46. Section of a testis affected with tubercle; some of the tubercles have coalesced to form large masses, and in the midst of these caseous areas may be seen the necrotic remains of some of the tubules. Giant-cells are very numerous, some being of very large size. (Stained with hæmatein and eosin.)
47. Section of a thickened Fallopian tube affected with tuberculous disease; the mucous membrane of the tube is entirely replaced by tuberculous material; a few giant-cells are present.
48. Section of a breast showing tuberculous disease of its glandular portion; the acini and ducts are replaced by a mass of cellular tissue containing large numbers of giant-cells; the remains of the ducts, greatly dilated and filled with granulating tissue, are seen in some of the nodules.
49. Section of another breast in which the disease has proceeded much further, involving the connective tissue as well as the glandular structure. A few giant-cells are present.

Lachrymal Gland.

50. Section of a lachrymal gland affected with tuberculous disease.

Ear.

51. Section through the tissues covering the outer wall of the antrum, from a case of tuberculosis of the ear ('Morbid Anatomy' Series, Specimen No. 415). The section is stained with carbol fuchsin and methylene blue, and shows tubercle bacilli.

Skin.

52. Section of the skin of the eyebrow showing extensive infiltration by tubercle; caseation has taken place in one or two places, and a giant-cell is seen here and there. The epithelium is thinned, but has not given way. There is much round-celled infiltration. (Stained with hæmatein and eosin).
53. Section through a portion of a large mass of tuberculous granulation tissue which occurred in the leg; it shows much round-cell infiltration with many large giant-cells.
54. Section through a granulating ulcer of the skin; there is much round-cell infiltration with several ill-developed tubercles; giant-cells are present.

Lupus.

55. Section of skin affected with tuberculous disease (Lupus); the tubercles have coalesced to form a large mass in the derma, but at the outskirts several discrete tubercles are visible. There is a large amount of round-celled infiltration, and much fibrosis of surrounding connective tissue; giant-cells are present. The epithelium, although much thinned, is intact. (Stained with hæmatein and eosin.)

Carcinoma associated with Tuberculosis.

56. Section of portion of a large lymphatic gland from the neck, showing tuberculous disease complicated by a secondary deposit of carcinoma; the primary growth occurred in the œsophagus. Caseous tubercles with giant-cells are present in the gland tissue surrounding the new growth.

Leprosy.

57. Section of the skin of the ear from a case of leprosy; stained with carbol fuchsin and methylene blue; clumps of bacilli are to be seen in the thickened derma.

Actinomycosis.

58. Section of a lung with a deposit of actinomyces; it shows the characteristic mycelial network very well. (Stained by Weigert's method.)

59. Section of liver affected with actinomycosis ; the masses of mycelium are surrounded by a good deal of pus and inflammatory tissue. (Stained by Weigert's method.)
60. Section showing deposit of actinomyces in neighbourhood of the liver ; the mycelial network is well shown. (Stained by Weigert's method.)

"Madura Disease."

61. Section from a foot affected with "Madura Disease ;" the masses of the fungus are well shown. (Stained by Gram's method and alum carmine.)

MORBID ANATOMY OF TUBERCULOSIS (HUMAN).

MACROSCOPIC AND MICROSCOPIC PREPARATIONS.

XVI. SERIES OF LARGE MICROSCOPIC SECTIONS, LANTERN SLIDES, AND DRAWINGS, ILLUSTRATING SOME OF THE PATHOLOGICAL CHANGES OCCURRING IN THE HUMAN LUNG IN TUBERCULOSIS.

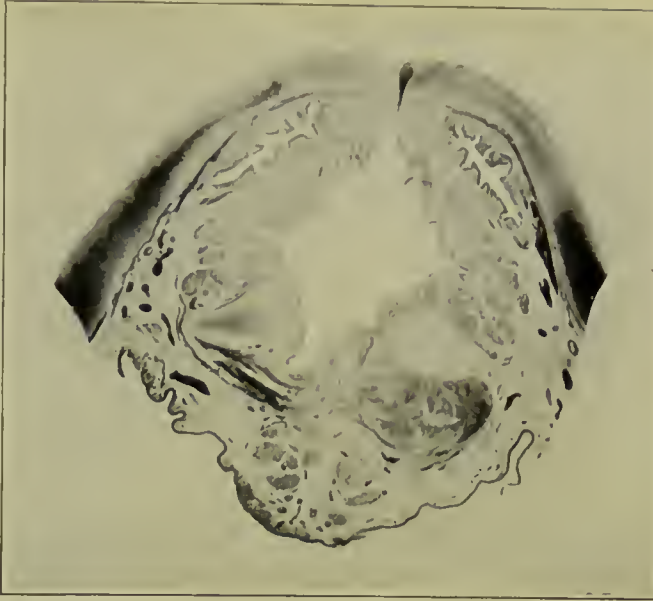
By PROFESSOR SIMS WOODHEAD, M.D.

Large Microscopic Sections.

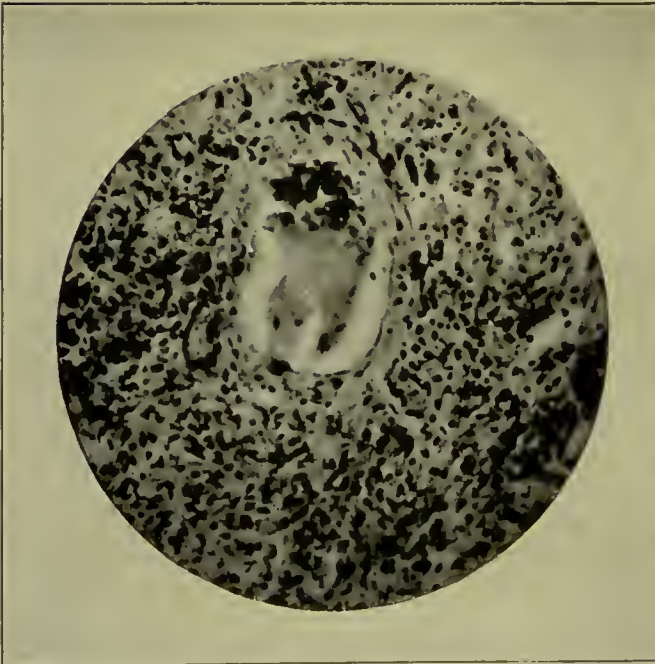
1. Acute miliary tuberculosis of the lung.—Here bacilli are probably carried to the lung by the minute blood-vessels. Note the large number of small consolidated tuberculous areas.
2. Acute miliary tuberculosis of the lung with pleurisy.—Note the caseous and pigmented area in the upper lobe of the lung. In this specimen catarrhal changes are found in addition to the acute miliary changes. In the upper lobe of the lung there is evidence of a healed tuberculous process, a contracted pigmented cicatrix indicating the site of the old lesion.
3. Acute miliary tuberculosis supervening on a chronic pleurisy.—This condition is confined to the upper lobe of the lung. Here, as in specimen (4), associate the tuberculosis with the pleurisy.
4. Lung of child.—Tuberculous glands at the root of the lung. Hæmorrhages and catarrhal patches scattered over section. A thrombus is seen in the pulmonary artery.
5. Lung of child with acute caseous tuberculous catarrhal pneumonia.—The areas of consolidation and breaking-down or cavity formation are here very well seen.
6. Acute miliary tuberculosis.—Lung of child æt. 8. Large gangrenous cavity in upper lobe. Acute miliary tubercles and caseous patches in the lower lobe. Cavity formation in both upper and lower lobes. Well-marked pleurisy.
7. Stonemason's phthisis.—Lung of man æt. 50. Chronic thickening of pleura. Considerable increase in amount of pigmented fibrous tissue. Adhesion of lobes of lung. Areas of consolidation,—broncho-pneumonic and caseous (tuberculous). Dilatation of bronchi. Cavity formation.

8. Chronic thickening of the pleura.—Chronic phthisis. Cavity formation. Glands at root pigmented, tuberculous; a number of fibroid tuberculous nodules are seen, especially in the lower lobe.
9. Chronic fibroid tubercle of the lung.—Old pleurisy, caseation, and cavity formation.
- 10—15. Series of lungs of children who have died from tuberculous catarrhal pneumonia.—Note the tuberculous glands at the root of the lung in Nos. 11, 13, 14, and 15.
16. Chronic thickening of pleura of upper lobe.—Well-marked pneumonia of upper lobe, and also in patches of lower lobe. Doubtful case of tuberculosis. In the large cavity formed in the upper lobe hæmorrhage has occurred.
- 17—18. Stained and unstained specimens of a section of the lung from a case of chronic fibroid phthisis—tuberculosis.—Note the pigmentation in the consolidated patches, the thickening around some of the bronchi, and the caseation in the centre of some of the areas of consolidation.
- 19—20. Sections of lung of a child—naked-eye and microscopic—showing tuberculous glands at the root, and caseous, tuberculous patches scattered throughout. More advanced in upper than in lower lobe; small cavity in process of formation in the upper lobe, and at the upper border of the lower lobe.
21. Section of lung of child suffering from tuberculosis; tuberculous gland at root. Notice distribution along lines of bronchi. Note also that the injection does not pass into the tuberculous masses, *i.e.* the tubercle nodule contains no blood-vessels. Caseation fairly well marked in some of the tubercle nodules.
22. Section of lung with tuberculous catarrhal pneumonia. Note wide diffusion of nodules.
23. Acute miliary tuberculosis of lung of child.—Tuberculous catarrhal process between primary nodules. Note extreme consolidation at the base of the lung, owing to fixation of the lower portion of the thoracic wall.
- 24—25. Specimen of lung of child showing cavity in upper part of lower lobe. Common position of cavities in children and in monkeys. Glands at the root tuberculous, caseous. Consolidation and caseation in other parts of lung. The two lobes are bound together. Consolidation at the lower angle of the lower lobe, and of the lung, where it rests on diaphragm.
26. Lungs of child æt. 22 months, affected with rapidly caseating tubercle.
27. Consolidated lung with pleurisy. Young child. ? Syphilis ? Tuberculosis.





Tuberculosis of the Larynx, xvii, 1, 2, 3.
Horizontal section ($\times 4$) of the larynx of a child *æ*t. 1 year.
Deposition of tubercle in the inter-arytenoid region.



Horizontal section ($\times 350$) through the inter-arytenoid region of the larynx of an adult.
Endothelial cell proliferation and giant-cell formation in the presence of tubercle bacilli.

Lantern Slides.

Series of lantern slides illustrative of the pathology and bacteriology of tuberculosis. Descriptions of the individual slides are given on the cards attached to the stand on which the slides are arranged.

Drawings.

A series of drawings illustrative of the pathology of tuberculosis, as shown in the large sections. A description of each drawing is attached.

XVII. TUBERCULOSIS OF THE LARYNX.

By W. JOBSON HORNE, M.D.

1. The larynx of a child, æt. 1 year, who died of general tuberculosis. Autopsy May 7th, 1894. The specimen shows a horizontal section of the entire larynx cut through the ventricular bands immediately above the vocal cords, so that the ventricles are opened at their anterior extremities.

In the inter-arytenoid region, to the right of the middle line, and immediately behind the right arytenoid cartilage, there is to be seen a deposit of tubercle, which has caused the mucous membrane lining the inter-arytenoid space on this side to be projected forward as a small excrescence into the glottis.

The entire larynx was first hardened, then imbedded and cut in celloidin, and afterwards mounted in glycerine jelly.

2. A microscopic section of the preceding specimen cut at the same level; there is no eruption of the mucous membrane lining the interior of the larynx and ventricles.
3. A microscopic section from the larynx of an adult. It is cut horizontally through the inter-arytenoid region, and shows tubercle bacilli, endothelial cell proliferation, and giant-cell formation. The superjacent epithelium is intact. (Autopsy February, 1898.)

The preceding specimens illustrate the beginning of the disease and the site in the larynx commonly attacked.

4. A microscopic section cut vertically through a ventricular band and vocal cord at a spot posterior to the vocal process. The section demonstrates a protective action of the epithelium (*pachydermia laryngis diffusa*). The epithelium in places is thickened (*hyperplasia*), and the fibrous tissue in the submucosa is increased; imbedded in and beneath this may be seen tubercles and numerous giant-cells.

5. An adjacent section from the same larynx as No. 4, stained to show tubercle bacilli, which are present.
 6. A microscopic section cut in a similar plane from a case of quiescent or arrested tuberculosis of the larynx. The section shows an increase of fibrous tissue, and some giant-cells.
 7. A section from the same case stained to show tubercle bacilli, but none have been met with.
- The four preceding sections illustrate the way in which the disease may become quiescent or arrested.

XVIII. TUBERCULOUS ULCERATION OF THE SKIN OF THE ANUS.

By STANLEY BOYD, F.R.C.S.

The specimen was removed from a man *æt.* 47. The symptoms dated from the end of 1898. He had had a constant purulent discharge from the anus, but never any bleeding. He had not lost flesh or strength. When he was first seen in November, 1899, he was thin and rather pale. A cavity admitting the last phalanx of index finger occupied the right and anterior aspect of the anus; the skin around was slightly infiltrated, and there were three small ulcers in front, behind, and on the left of the anus. There was little subjacent induration; the edges were slightly swollen and bluish; the bases greyish or reddish, smooth, level with the edge, not showing anything like tubercles or caseation. The discharge was pus. Antiseptic treatment did no good.

The structure of an excised bit showed distinct giant-cell systems. In two months all the ulcers were larger, and two more had appeared on the skin round anus (5 in all).

All were excised freely in January, 1900. The large wound resulting from excision of the anal ulceration never healed completely in spite of iodoform plugging, lactic acid, and carbolic acid at intervals, and residence at Margate.

Death occurred in September, 1900, apparently from acute pulmonary tuberculosis (fever, dyspnœa, râles over whole chest, three days' illness).

A microscopic section of the tissue removed is also exhibited.

XIX. MACROSCOPICAL PREPARATIONS OF TUBERCLE OF THE VALVES OF THE HEART, OF THE BLOOD-VESSELS, AND THE THORACIC DUCT.

By Professor BENDA, M.D.

(*Berlin, Krankenhaus am Urban.*)

The following specimens represent the point of invasion of general miliary tuberculosis; all have been verified by microscopic examination, and refer especially to the works of Benda upon this subject.

1. C. BENDA, "Untersuchungen über Miliartuberculose, Verhandl. der Berlin' med. Gesellsch.," 'Berlin klin. Wochenschr.,' 1884.
2. "Über acute Miliartuberculose Verhandl. der Berlin. med. Gesellsch.," 10th February, 1898, u. 15 März, 1899, 'Berlin. klin. Wochenschr.,' 1899.
3. "Acute Miliartuberculose vom aetiologischen Standpunkt," 'Lubarsch u. Ostertag Ergebn. der pathol. Anatomie, etc., Bericht über, 1898,' Wiesbaden, 1899.
4. "Über Endangitis tuberculosa," 'Verhandl. der Deutsch. patholog. Gesellsch.,' ii, 1899.

Valves of the Heart.

1. Endocarditis tuberculosa verrucosa et ulcerosa valvularum aortæ. (H., æt. 36. Autopsy February 2nd, 1898. Vertebral caries and chronic pulmonary tuberculosis, acute general miliary tuberculosis.) The specimen shows half of the left semilunar valve of the aorta with a tuberculous polyp in the form of a drop lying upon it, also caseous and tuberculous infiltration of the valve, the base of the valve, the aorta, and the wall of the heart.

A photograph shows the entire valvular apparatus of the aorta with the tuberculous changes of the left and of the posterior valve.

Blood-Vessels.

2. Tuberculous growth of the intima of an aorta with arterio-sclerosis. (T., æt. 51. Autopsy June 6th, 1899. Chronic pulmonary phthisis, acute general miliary tuberculosis.) The specimen is so mounted that the intima is rolled outwards. The intima contains numerous sclerotic and atheromatous spots and small ulcerations. From one point of the surface projects a flat polypoid growth (the only one of this character found) which is somewhat ulcerated and covered with minute blood-clots. Upon section one sees caseous tubercles in the growth and a partial involvement of the media.
3. Polypoid tubercle of the pulmonary vein. (S., æt. 41. Autopsy May 9th, 1901. Chronic pulmonary phthisis, acute general miliary tuberculosis.)

The tubercle is seen in one branch as a flat parietal growth lying longitudinally. The proximal end in the direction of the heart has a small bulbar expansion, so that it looks like a frozen drop. Peripherally it becomes an obliterating tuberculous thrombus of one of the small veins. (Specimen is hardened after Dr. Kaiserling's method.)

4. Polypoid tubercle of pulmonary vein, longitudinal section. (K., æt. 24. Autopsy March 8th, 1898. Chronic glandular tuberculosis and tuberculous coxitis, acute general miliary tuberculosis.) The end of this tubercle extends along the lower pulmonary vein into the auricle of the heart; in other respects and appearance it is the same as described in specimen 3. Upon section one sees that the tubercle lies upon the intima without penetrating the entire wall. The outlying tuberculous glands have no direct connection with it.
5. Multiple tuberculosis of the pulmonary veins. (H., æt. 24. Autopsy January 31st, 1900. Chronic pulmonary phthisis, acute general miliary tuberculosis.) In the specimen three tubercles are dissected out; the two larger resemble those in specimens 3 and 4; the third and smaller projects like a button from the intima into the lumen.

Thoracic Duct.

6. Recent tuberculosis of the thoracic duct. Solitary caseous valvular endangitis and intima-tuberculosis. (T., æt. 41. Autopsy February 6th, 1901. Insignificant chronic pulmonary tuberculosis, unilateral (right) pleural tuberculosis, acute general miliary tuberculosis.) The thoracic duct is probably infected through the pleural tuberculosis. The specimen shows only the upper part of the duct. We see here upon the upper surface of a single pair of valves a caseous thrombus, upon the lower surface a fresh thrombus containing blood and fibrin. The former continues upwards for several centimetres, adherent in its entire length to the intima, which is somewhat ulcerated. Also, higher up, fresh miliary tuberculosis of the intima of the duct.
7. Later stage of thoracic duct tuberculosis. Multiple caseous endangitis valvularis and parietalis. (B., æt. 60. Autopsy July 22nd, 1897. One isolated tuberculous ulcer of ileum, caseous lymphadenitis mesenterica, and retro-peritonealis, acute general miliary tuberculosis.) The duct is infected through the retro-peritoneal lymphatic roots. The specimen shows several caseous valves and intima-foci without extensive ulceration, principally in the lower part of the duct.
8. Same stage of duct tuberculosis as 7. Parietal endangitis tuberculosa, and tuberculous aneurysms. (S., æt. 52. Autopsy July 24th, 1899. Chronic pulmonary and uro-genital tuberculosis with retro-peritoneal glandular

and general miliary tuberculosis.) The duct is infected through the retro-peritoneal lymphatic roots which contain tuberculous thrombi. The lower part of duct shows caseous valves with spindle-shaped widening of the lumen.

9. Same stage of duct tuberculosis as 8. Valve caseation and extensive miliary tuberculosis of intima. (B., æt. 36. Autopsy April 25th, 1899. Pulmonary and intestinal phthisis, tuberculosis of mesenteric glands, acute general miliary tuberculosis.) The duct is probably infected through the mesenteric roots. Tuberculous thrombus of one root. Isolated valve in the lower third caseating, extensive miliary tuberculosis of the entire intima of duct. In the cisterna superior numerous confluent broken-down tubercles, and a small tuberculous polyp covered with fibrin-clots (an indication of fresh ulceration).
10. Diffuse chronic duct tuberculosis. (Z., æt. 35. Autopsy July 30th, 1897. Extensive chronic tuberculosis of mesenteric and mediastinal lymphatic glands, acute general miliary tuberculosis.) Extensive caseous, parietal and valvular endangitis; tuberculous and fibrinous thrombi, several stenoses and aneurysms of lumen; miliary tuberculosis of intima; caseous and tuberculous periangitis. Numerous adhesions with mediastinal lymphatic glands; the latter are, in a large degree, caseous, but there is no immediate connection existing between the morbid process in the glands and the duct lumen.
11. Chronic recurrent duct tuberculosis. Scirrhotic tuberculosis of one pair of valves, caseous endangitis valvularis, miliary intima tuberculosis. (P., æt. 50. Autopsy April 13th, 1899. Old encapsulated pulmonary and glandular tuberculosis, acute general miliary tuberculosis.) Infection of duct through the retro-peritoneal roots. In lower third a cicatricial adhesion of a pair of valves, and underneath are numerous intima tubercles (backward infection?). Middle third of the duct uninvolved. In the lower portion of the upper third of the duct there is caseation of a valve, above which extensive miliary intima tuberculosis and small polypoid caseous tubercles, especially in the cisterna superior.
12. Chronic recurrent duct tuberculosis with partial cessation of the morbid process, obliterating thrombosis of the upper part; caseous valvular endangitis and miliary tuberculosis of intima of the middle part, dilatation of the lower part of the duct. (P., æt. 46. Autopsy December 23rd, 1897. Chronic pulmonary and intestinal phthisis, glandular tuberculosis, chronic general miliary tuberculosis.) The lumen of the lower third of the duct, of the cisterna chyli and of the roots is greatly dilated, and the wall thickened. At the upper end of this portion is found an extensive valvular tuberculosis with a breaking-down thrombus of the lumen; immediately above there is an old organised thrombus entirely ob-

literating the lumen; above this a small (2 cm. in length) open space with extensive tuberculosis of intima; and lastly, obliterating the rest of the duct lumen, an apparently organised thrombus, which contains some spindle-shaped caseous tubercles. The organised thrombus, however, microscopically showed but few fresh tubercles. Communication between the unobstructed portions of the duct and the venous system is accomplished in all probability through the collateral circulation, as found and described by Astley Cooper, 1798. The collaterals are not dissected out in this specimen.

XX. SPECIMENS ILLUSTRATING RARE EFFECTS OF TUBERCULOSIS OF LYMPHATIC GLANDS.

By T. D. ACLAND, M.D.

1. Specimen taken from a case in which death resulted from the suppuration of a caseous lymphatic gland through the crico-thyroid membrane, and its subsequent impaction below the vocal cords.

From A. S., female, æt. 28. Admitted into Brompton Hospital, December, 1898, suffering from suppurating cervical glands; (?) tuberculous; syphilitic ulceration of mucous membrane of palate; laryngitis with complete fixation of right vocal cord, and induration of upper part of lobe of right lung. No tubercle bacilli were found in the sputum. The suppurating glands were removed by operation, and the patient seemed to be doing well until a fortnight after admission, when she got out of bed in the middle of the night, and was found by the nurse on the floor. There is said to have been no cyanosis. She died after one or two spasmodic movements, before the house physician could be summoned. Post mortem, a gland loosened from its capsule by suppuration was found to have ulcerated through the anterior part of the cricoid cartilage into the trachea, making an opening as large as a threepenny piece. The gland was found lying free in the trachea.

2. Specimen showing collapse of the upper lobe of the left lung, resulting from the pressure of enlarged tuberculous glands on the main bronchus. The collapsed lung is infiltrated with tubercle; from the history of the case this was probably secondary.

L. M., female, æt. 2½. Admitted into St. Thomas's Hospital February, 1901, with a history of ill-defined symptoms for about seven weeks. On admission there were impaired percussion resonance, defective movement, feeble and bronchial respiratory murmur over the upper part of the left lung; a suspicion had been raised that there might be a localised empyema in this situation. Temperature during first week not above 100°. Diagnosis—Probably collapsed lung. Three weeks later unmistakable signs of pulmonary tubercle were detected, and a few days later symptoms of tuberculous meningitis occurred. These continued until death, thirteen weeks after the onset of the first symptoms of ill-health.

XXI. TUBERCULOSIS OF THE TESTICLE.

By LENTHAL CHEATLE, C.B., F.R.C.S.

Three examples from nine consecutive cases.

1. A testicle in which the epididymis is only infected ; the testis itself contains here and there more strands of fibrous tissue than normal, but otherwise it is unaffected. This is the only gland of the series of nine that had no secondary tuberculous foci in the testis, and was not markedly abnormal.
- 1a. Large microscopic section.
2. The epididymis is much affected and many secondary foci appear in the testis itself. Secondary deposit of tubercles appeared in the testis in seven out of nine.
- 2a. Large microscopic section.
3. The epididymis is much affected. Although no secondary foci can be detected in the testis the gland is quite abnormal and shows a general fibrosis. There was no history or sign of syphilis about the patient from whom the gland was removed. Neither was there a history of previous trauma nor trouble in it. The affection was rather acute, as he only complained of the testicle three months before its removal. This is quite a rare complication of a tuberculous epididymis.
- 3a. Large microscopic section.

XXII. PREPARATIONS DEMONSTRATING TUBERCULOUS DISEASE OF THE EAR.

By ARTHUR H. CHEATLE, F.R.C.S.

1. Right temporal bone of an infant who died of general tuberculosis. There is a perforation in the posterior segment of the membrana tympani.
The lining membrane seen through is thick and nodular. The ossicles are intact. The middle ear, including the antrum, contained cheesy pus. The middle ear has been opened through the roof. Sections of the lining membrane, stripped off from the external semi-circular canal, showed caseous patches, giant-cells, and tubercle bacilli (22.)
- 1a. Drawing of microscopical section.

2. Left temporal bone of a child who died of general tuberculosis. The middle ear is disorganised by tuberculous disease. The membrana tympani has been completely destroyed. The handle, short process and neck of the malleus, together with the descending articular process of the incus, have been lost. The tympanic ring is necrotic. Perforations are seen through the floor into the jugular fossa. The promontory is carious. The stapes remains *in situ*. The middle ear contained brown pus. (23.)
3. Right temporal bone of an infant who died of general tuberculosis. The bone is extensively diseased. The antrum was opened during life, caries of the roof being found with implication of the adjacent dura mater, sections of which after death showed tuberculous disease. The middle ear is quite disorganised. The Fallopian canal is carious and open, the facial nerve destroyed. The promontory is rough and carious. Both the fenestræ are irregularly enlarged, and the disease has invaded the bony labyrinth. Extension of the disease was proceeding at death, the affected bone being white and porous. A wire is passed through the Fallopian canal. (24.)
4. Right temporal bone of a child aged two years and five months, who died of general tuberculosis. The middle ear was full of brown pus. The lining membrane was thickened. The membrana tympani was removed after death.
A perforation through the floor of the middle ear to the jugular fossa is present. (24A.)
5. Left temporal bone of a child aged one year who died of general tuberculosis. The middle ear was full of brown pus. The lining membrane was thickened. A perforation through the floor of the middle ear to the jugular fossa is present.
The membrana tympani was removed after death. (24B.)
6. Right temporal bone from previous case (5) showing similar condition. (24C.)

PHOTOGRAPHS, SKIAGRAMS, AND CASTS.

XXIII. INFANTILE TUBERCULOSIS.

By Dr. P. HAUSHALTER and Dr. L. SPILLMANN,

Agrégés of the University of Nancy.

Fifty photographs showing the lesions in infantile tuberculosis of the lung, the tracheo-bronchial, and the mesenteric glands, the intestine, the peritoneum, the brain, etc.

XXIV. SKIAGRAMS.

By HUGH WALSHAM, M.D.

1. Tuberculous consolidation of the apex of the right lung. The skiagram shows well the flattening of the right side of the chest.
2. Advanced pulmonary tuberculosis of both lungs, showing a cavity at the left apex.
3. Skiagram of the chest of a child showing miliary tuberculosis of both lungs. The chest is viewed from the back.
4. Skiagram showing tongue, œsophagus, trachea, bronchi, and lungs of a child, radiographed after removal from the body. The lungs are seen to be stuffed with miliary tubercle.
5. Lung affected with chronic tuberculosis. Skiagraphed after removal from the body. The dense shadow seen at the apex of the upper lobe denotes caseation; the lighter spaces in this dense shadow mark the position of small cavities. The rest of the lung was affected with green and miliary tubercle.
6. Advanced pulmonary tuberculosis of both lungs.
7. Pulmonary tuberculosis of both lungs; the dense caseous shadow at the right apex is well seen, also the falling in of the chest on this side.
8. Advanced pulmonary tuberculosis of both lungs.
9. Advanced pulmonary tuberculosis of both lungs.
10. Chronic pulmonary tuberculosis of both lungs, skiagraphed after removal from the body. A large cavity is seen excavating nearly the whole of the left upper lobe. The grey and yellow tubercle is well seen scattered through the right lung.
11. Skiagram of lungs and heart after removal from the body. Caseous tubercle is seen at the apex of the right lung, with numerous cavities and general infiltration of the left lung, with grey and yellow tubercle.
12. Skiagram of sections one inch thick of right and left lung. The whole of the right upper lobe was caseous and breaking down. The apex of the left lobe was also caseous, and contained numerous cavities.
13. Advanced pulmonary tuberculosis of both lungs.
14. Skiagram of thorax with heart and lungs removed, showing the cardiac lines.

XXV. SKIAGRAMS.

By Dr. ERNEST MARTIN.

1. Complete pneumothorax, left side, showing displacement of viscera and tubercle of lungs.
2. Pyo-pneumothorax, left side, showing displacement of viscera, adhesions, and grey tubercle of a lung.
3. Pneumothorax, left side, showing extreme displacement of heart to right side; it also contains clear serum.
4. Pneumothorax and external wound; pressure inside and outside equal. (By Dr. Hugh Walsham.)
5. Miliary tubercles in lung, taken post-mortem.
6. Miliary tubercles in lung, three exposures of five, ten, and fifteen seconds.
7. Healthy lung, taken post-mortem, showing outlines of lobules and air vesicles. (Compare with No. 5.)
8. Chronic phthisis with fibrosis in child, showing retraction of chest and shadows of fibrosis.
9. Chronic caseous phthisis, both lungs
10. Early phthisis, one apex.
11. Pleurisy with effusion (tuberculous).
12. Chronic phthisis and cavitation.

XXVI. CASTS SHOWING PROGRESSIVE CHANGE IN THE SHAPE OF THE FINGERS AND NAILS IN PHTHISIS PULMONALIS.

By Dr. J. J. GALBRAITH.

1. Normal hand showing tapering fingers and straight finger-nails with only transverse curvature. No cyanosis.
2. Hand of girl in early stage. Fingers still tapering. Slight cyanosis of nails. Slight vertical curvature and increase of transverse curvature.

3. Hand of man in later stage, tapering of fingers has disappeared, transverse curvature considerably exaggerated, vertical curvature marked (slight cyanosis longer duration than Case 2).
4. Hand of man æt. 70, modified by age and work. Transverse curvature exaggerated, vertical marked. Cyanosis considerable and of long standing. (Right-sided empyæma and phthisis.)
5. Hand of boy æt. 19. Disease commenced before growth stopped. Changes in shape of fingers exceeding in extent the nail changes. Considerable cyanosis and weak circulation.
6. Hand of man æt. 26. Advanced pulmonary disease. Marked change in nails, but change in shape not so marked. Feeble circulation. Note roughness and malnutrition of skin.
7. Hand of girl æt. 21. Advanced pulmonary disease. Marked change in nails and considerable change in finger-tips.
- 7a. Section of thumb showing exaggerated vertical curvature and thickness.

COMPARATIVE MORBID ANATOMY AND PATHOLOGY.

TUBERCULOSIS—ANIMAL.

XXVII. PREPARATIONS FROM THE ROYAL VETERINARY
COLLEGE, LONDON.

By PROFESSOR MACFADYEAN, F.R.S.E.

BOVINE TUBERCULOSIS.

1. Vertebra affected with tuberculosis.
2. Heart, tuberculous pericarditis.
3. Laryngeal tuberculosis.
4. Lung, chronic broncho-pneumonic tuberculosis.
5. Rumen with tuberculous ulcer.
6. Small intestine with tuberculous ulcer.
7. Small intestine showing tuberculous Peyer's patch.
8. Peritoneum with commencing tuberculosis—"Grapes."
9. Peritoneum with advanced tuberculosis—"Grapes."
10. Liver, chronic caseous tubercles.
11. Bronchial gland, tuberculous.
12. Kidney, disseminated tubercles.
13. Kidney, diffuse lesions affecting a few lobules.
14. Epididymis.
15. Brain, caseous tuberculous lesion in cerebrum.
16. Mammary gland affected with tuberculosis.
17. Mammary gland affected with tuberculosis.
18. Subcutaneous tuberculous lesion of the fetlock.

CONGENITAL TUBERCULOSIS.

19. Tuberculous liver.
20. Tuberculous spleen.

EQUINE TUBERCULOSIS.

21. Lung. Acute miliary tuberculosis.
22. Lung. Acute miliary tuberculosis.
23. Lung. Acute miliary tuberculosis.
24. Small intestine. Tuberculous ulcer.
25. Small intestine. Tuberculous ulcer.
26. Cæcum, showing tuberculosis.
27. Spleen. Large tuberculous nodules.
28. Spleen. Wax model. Large tuberculous nodules.
29. Submaxillary gland. A rare lesion simulating glanders.

PORCINE TUBERCULOSIS.

30. Lung, tuberculosis.
31. Lung, tuberculosis.
32. Liver, tuberculosis.
33. Liver, tuberculosis.
34. Spleen, tuberculosis. Tumour-like nodules.

CANINE TUBERCULOSIS.

35. Tuberculous pericarditis.

FELINE TUBERCULOSIS.

36. Spleen, tuberculosis.

AVIAN TUBERCULOSIS.

37. Tuberculous ulcers of small intestine of a fowl.
38. Tuberculous lesions of the mesentery and small intestine of a fowl.
39. Liver of fowl.
40. Spleen of fowl.

XXVIII. PREPARATIONS FROM THE ROYAL COLLEGE OF SURGEONS.

HEART AND PERICARDIUM.

1. The heart of a fowl showing many large deposits of tubercle beneath the pericardium, and in the muscular substance of the ventricles. Presented by Mr. W. Halsey (1896).
R.C.S. Museum, 2930Aa.
2. The contents of the thorax of a coati from South America. The visceral pleuræ are covered with prominently projecting tubercles varying in size, from a millet-seed to a small pea. These are larger and much more numerous on the lower lobes of the lungs. The pleural surface of the diaphragm, as well as the pericardium, are covered with tuberculous deposits and exudation. Microscopic examination revealed characteristic bacilli in the tubercles. Presented by J. Bland-Sutton, Esq., 1885.
R.C.S. Museum, 3324A.
3. The thoracic viscera of a baboon, which died from extensive tuberculosis (see preparations 22, 23). The pericardium is studded with masses of tubercle, and completely adherent. The bronchial glands are greatly enlarged; the pleura has numerous tuberculous masses upon its surface, and is thickened and coated with lymph. In the section which has been made of both lungs no distinct tubercle is to be seen; but the lungs look solid and infiltrated throughout. In the muscular substance of the ventricle there is a small deposit. Presented by the Zoological Society, 1864.
R.C.S. Museum, 2930.
4. A vertical section of the heart of an ox, which was affected with general tuberculosis. The heart is completely embedded in a mass of tuberculous material, which fills the cavity of the pericardium. On the out side of the preparation the fibrous coat of the pericardium may be seen, and between this sac and the exterior of the heart, marked by the layer of white subpericardial fat, the tuberculous deposit forms a dense yellowish coating two inches in depth at its thickest part. The grooves at the base of the heart, and around the origins of the larger vessels, are all filled with the same substance. The reverse of the specimen shows that the mass is made up of closely-packed nodules, varying greatly in size, and for the most part caseous in the centre. Near the apex of the heart the tuberculous material has perforated the pericardium, forming a group of small polypoid tumours. Presented by J. Bland-Sutton, Esq., 1892.
R.C.S. Museum, 2930A.

5. The heart and part of one of the lungs of a monkey. In the substance of the lung tuberculous matter is thickly and almost uniformly infiltrated, and there are numerous small irregular cavities variously opening into one another, and bounded only by the infiltrated substance of the lung. The pleura is very much thickened. From the Museum of George Langstaff, Esq.

R.C.S. Museum, 3402.

PLEURÆ AND LUNGS.

6. The lungs of a canary bird, in both of which there are comparatively large circumscribed masses of tubercle.

R.C.S. Museum, 3383.

7. The lungs of a flamingo (*Phenicopterus rubrum*) affected with tuberculosis. The parenchyma of both lungs is studded with tubercles, chiefly yellow, varying in size from a millet to a mustard seed. Presented by J. Bland-Sutton, Esq., 1885.

R.C.S. Museum, 3383A.

8. Section of the lung of a binturong. Tuberculous matter is deposited in a circumscribed space at and below the surface of the lung. The deep outlines of this space are formed of the tissue between some of the lobules of the lung, thickened, indurated, and opaque white, and several adjacent lobules beyond this space are surrounded with similarly thickened interlobular tissue. Within the space occupied by the tuberculous matter there are appearances of its having been first deposited in the interlobular tissue, for the lines in which this tissue lay are filled with firm and compact tuberculous matter. In some of the lobules, also, so much tuberculous matter is deposited that they appear solid, pale, yellowish white-like masses of tubercle, in which none of the original pulmonary texture can be discerned, but in other lobules there remain distinct traces of the air-cells, which appear surrounded with tuberculous matter, as if this morbid substance first surrounded a lobule, and then gradually spread to its central parts, and filled every air-cell in it. The vessels of the lung are minutely injected, but none are discernible where the tuberculous matter is deposited. Presented by the Council of the Zoological Society.

R.C.S. Museum, 3384.

9. A vertical section of the lung of a babyrussa, thickly beset with solid masses of opaque yellow tuberculous matter. Where these are, no trace of the pulmonary texture can be discerned; the morbid substance appears to be deposited in every part of it. Some of the masses, which

are very various in size and shape, are partially softened ; many have granules of calcareous matter scattered in them in groups, and tortuous and branching lines. Presented by the Council of the Zoological Society.

R.C.S. Museum, 3385.

10. The contents of a thorax of a Macaque monkey. The upper lobe of the right lung is affected with caseous pneumonia. Its section is solid, of a grey colour, interspersed with patches of yellow caseous material. Tubercles are scattered on the surface of the lower lobes of the right and left lungs. Presented by J. Bland-Sutton, Esq., 1885.

R.C.S. Museum, 3380A.

11. A section of the lung of an elephant infiltrated with tubercle. In addition to large nodules of yellow material there is a general infiltration of the lung tissue, rendering it completely solid, except at the lower part of the preparation.

The animal had lived in the Zoological Gardens for twenty-five years, and was probably under thirty years of age at death. It was suddenly seized with a fit of epileptiform nature, followed by coma, and was therefore poisoned. Tuberculous deposit was found in the pia mater. Presented by the Zoological Society, 1856.

R.C.S. Museum, 3382.

LIVER.

12. The liver of a python extensively affected with tubercle, chiefly in the form of smaller and larger rounded masses of a yellowish-white colour, or widely infiltrated from the coalescence of adjacent masses. The tuberculous formations are rendered more distinct by the injection of the blood-vessels. Microscopically, the early stage in the formation of the tuberculous nodules consisted of a well-defined rounded area, at the circumference of which was a thin layer of deeply-stained cells, apparently the result of inflammatory new formation ; this layer enclosed a mass of unstained, ill-defined, and apparently degenerating cells and *débris*. The animal died with a large abscess in the abdominal cavity, near the gall-bladder. The abscess walls were much thickened, and covered with caseous material. (See 'Trans. Path. Soc.,' vol. xxiv, 1883, p. 323). Presented by J. Bland-Sutton, Esq., 1884.

R.C.S. Museum, 2755A.

13. The liver of a Cape hyrax, with numerous yellow tuberculous patches in it. These consist of small grain-like tubercles. Presented by the Zoological Society, 1865.

R.C.S. Museum, 2757.

15. Portion of a pig's liver, throughout which there are thickly scattered tubercles in a state of caseation, the largest being about a third of an inch in diameter.

The spleen, mesenteric glands, and lung were similarly diseased; the infection rose by way of the intestine. Histological examination shows the presence of tubercle bacilli in the lesions, though in very small numbers. Presented by Prof. J. McFadyean, Royal Veterinary College, 1898.

R.C.S. Museum, 4910.

16. The intestines and liver of a fowl. The liver is full of caseating foci of various sizes, the primary site of infection having been the intestine. In two situations in connection with the small intestine there are shown caseating tuberculous formations, opposite the centre of each of which the mucosa is ulcerated. There are a certain number of small tubercles scattered over the peritoneum. Microscopic examination revealed dense tubes of tubercle bacilli in the caseous foci. Presented by W. B. Tegetmeier, Esq., 1898.

R.C.S. Museum, 4911.

SPLEEN.

17. The spleen of a spurred plover, in which are deposited numerous roundish masses of yellow tuberculous matter, about the size of millet-seeds. There were tubercles also in the lungs and liver. Presented by Dr. Edwards Crisp.

R.C.S. Museum, 2882.

18. The spleen of a guinea-fowl in a similar condition. Presented by Dr. Edwards Crisp.

R.C.S. Museum, 2883.

19. The gizzard and spleen of a guan injected. The latter contains numerous small yellow tubercles. Presented by Dr. Edwards Crisp.

R.C.S. Museum, 2884.

20. Portion of the spleen of a calf showing a certain number of caseating nodules in the divided surface, due to tuberculosis which was congenital. The calf, when killed, was one week old. The mother was killed about the same time. The lungs of the cow were tuberculous, but no other lesions were observed. The uterus was not examined. The viscera of the calf in which tubercles were present were the liver, spleen, kidneys, and lungs. The hepatic lymphatic glands were enlarged so as to form a

mass about the size of a small hen's egg, and their substance was mottled with caseous streaks; the bronchial and mediastinal glands were also tuberculous, as were likewise one renal lymphatic gland, a few of the mesenteric, the right and left popliteal, and one of the prepectoral group. The heart, pleura, peritoneum, and the axillary pharyngeal and precrural lymphatic glands appeared healthy. The numbers of tubercle bacilli in the lesions were few. Prof. J. McFadyean, 'Path. Soc. Trans.,' vol. i, p. 270. Presented by Prof. J. McFadyean, Royal Veterinary College, 1899.

R.C.S. Museum, 4918.

21. A section from the spleen of a horse, in which there are extensive formations of tubercle. The formations are made up of lesser granulomata in varying degrees of confluence and of varying size. Some are considerably less than the miliary tubercles scattered over the viscus in the peritoneum. The new tissue is firm, grey, and somewhat translucent, and only in a few spots caseous; in some of the giant-cells which it contains a few tubercle bacilli could be demonstrated. From a gelding æt. 5. The site of infection was not determined. Presented by Prof. J. McFadyean, Royal Veterinary College, 1897.

R.C.S. Museum, 4909.

BRAIN.

22. The brain of a baboon (*Cynocephalus babuin*) with numerous small round masses of firm yellowish tubercle, imbedded in different portions of the surface. Most of them are about a quarter of an inch in diameter, and are readily turned out from the surrounding brain substance. One is situated in the pons Varolii on the right side, others are in the convolutions of the cerebral hemispheres. The thoracic and abdominal viscera of the animal were extremely tuberculated (see preparations Nos. 3 and 23). Presented by the Zoological Society, 1863.

R.C.S. Museum, 3773.

KIDNEYS.

23. The kidneys of a baboon, the one whole, the other in section. Both contain numerous rounded nodules of tuberculous matter about the size of peas, giving rise to elevations, where they occur near the surface. One supra-renal capsule is enlarged and pale as if from tuberculous deposit, and there are lymph-glands adjacent in a similar state. The liver was healthy, but the brain (22), heart (3), and other organs were affected. From an animal which died in the Zoological Gardens, June 20th, 1863.

R.C.S. Museum, 3574, 3574A.

OVARY.

24. Part of the abdomen of a hen pheasant, showing the ovary enlarged into a deeply lobulated mass, which measured, when fresh, 2·3 inches in length, 1·1 in breadth. The enlargement was found to be due to tubercle, which was generally diffused over the liver, pancreas, omentum, and other viscera.

A full account of the specimen will be found in a memoir by the donor, "On a Tumour of the Ovary in the Common Pheasant," 'Journal of Anatomy and Physiology,' vol. xiii, p. 91.

R.C.S. Museum, 4481.

MAMMARY GLAND.

25. A slice taken from the tuberculous udder of a cow. Over a large area of the section the lobules of the gland are enlarged, confluent, and caseous from tuberculous disease. Scattered through the caseous material are minute whiter areas of calcification. Microscopic examination showed the presence of large numbers of tubercle bacilli in the caseating substance and the granulation tissue. Presented by Prof. J. McFadyean, Royal Veterinary College, 1899.

R.C.S. Museum, 4912.

STREPTOTHRICOSIS.

26. A longitudinal section of the anterior portion of the tongue of an ox affected with actinomycosis.

The tongue was much enlarged, so that its end protruded from the mouth. Its texture is for the most part indurated from chronic inflammation, more particularly about the posterior fourth and along the lower border. Throughout the organ there are scattered nodular formations of granulation tissue due to disseminated growths of the streptothrix. The smallest of the granulomata are so minute as to be hardly visible. The larger are spherical aggregates of lesser foci and reach or exceed the size of peas.

The disease is particularly advanced towards the posterior portion of the tongue; here the new formations are parted by lines of dense fibrous tissue. No suppuration appears to have taken place. 'Path. Soc. Trans.,' vol. xxxvii (1884), p. 591. Presented by A. Lingard, Esq.

R.C.S. Museum, 4885.

27. A transverse section through the base of the tongue of an ox showing the same disease in a more highly advanced condition. The muscular sub-

stance has been widely replaced by extensive formations of granulation-tissue, which project high above the dorsum, in the form of coarse nodules or more extensive elevations.

The deeper lesions retain more or less of a spherical shape; and about them a considerable amount of fibrous tissue has been produced. A close inspection will disclose the presence of minute grains, streptothrix colonies, distributed through the diseased foci.

R.C.S. Museum, 4886.

28. A slice from a human liver showing several spheroidal actinomycotic formations averaging about one inch and a half in diameter. Each of these admits of being resolved into a series of foci about a tenth of an inch in diameter, of pale yellow colour, separated by translucent fibrous tissue. In the vicinity of the chief or compound lesions there are here and there outlying foci, consisting like the rest of suppurating granulation tissue; embedded in this are plainly discernible the small, more opaque grains or colonies of the streptothrix.

C. W., æt. 25, admitted under the care of Mr. Makins to St. Thomas's Hospital, October, 1896, complaining of nausea and vomiting, accompanied with continuous epigastric pain.

R.C.S. Museum, 4887.

MYCETOMA (MADURA DISEASE).

29. A slice from a foot affected with a severe and advanced form of mycetoma or Madura disease. The connective tissues in general are greatly swollen and transversed by coarse devious spaces, which contain aggregations of the pale yellow colonies of the Madura streptothrix.

The various bones, with the exception of the astragalus, are riddled with similar canals.

From a pariah æt. 25, employed at work in swampy districts. The disease commenced as a large nodule on the sole three inches behind the bases of the second and third toes. The foot became swollen, and remained so for nine years; it then became the seat of burning pains, and was removed.

R.C.S. Museum, 4889.

30. Portions of the scaphoid and internal cuneiform bones from the same foot, showing more particularly the canals traversing the osseous substance, which are thinly lined with connective tissue and hold the streptothrix colonies.

R.C.S. Museum, 4891.

XXIX. MICROSCOPIC PREPARATIONS ILLUSTRATING THE
COMPARATIVE PATHOLOGY OF TUBERCULOSIS.

By GEORGE NEWMAN, M.D.

The following specimens have been collected with others, during an investigation into the comparative pathology of tuberculosis in different animals. It is well known that the disease is widely prevalent in the animal kingdom, particularly in animals confined in limited cubic space, as in zoological gardens and similar institutions. The organs from which these specimens were produced were derived from the Zoological Society's Gardens in London, and I am much indebted to Mr. Beddard, F.R.S., for kindly allowing me every facility to secure what specimens I desired.

In some cases tuberculosis appears to affect only the organs of the alimentary canal, chiefly the liver, whilst in other cases the lungs are affected as well. It is comparatively rarely that one meets with tuberculosis of the lungs alone. When the lungs are affected the other organs are generally affected also. The liver appears to be the organ most commonly affected.

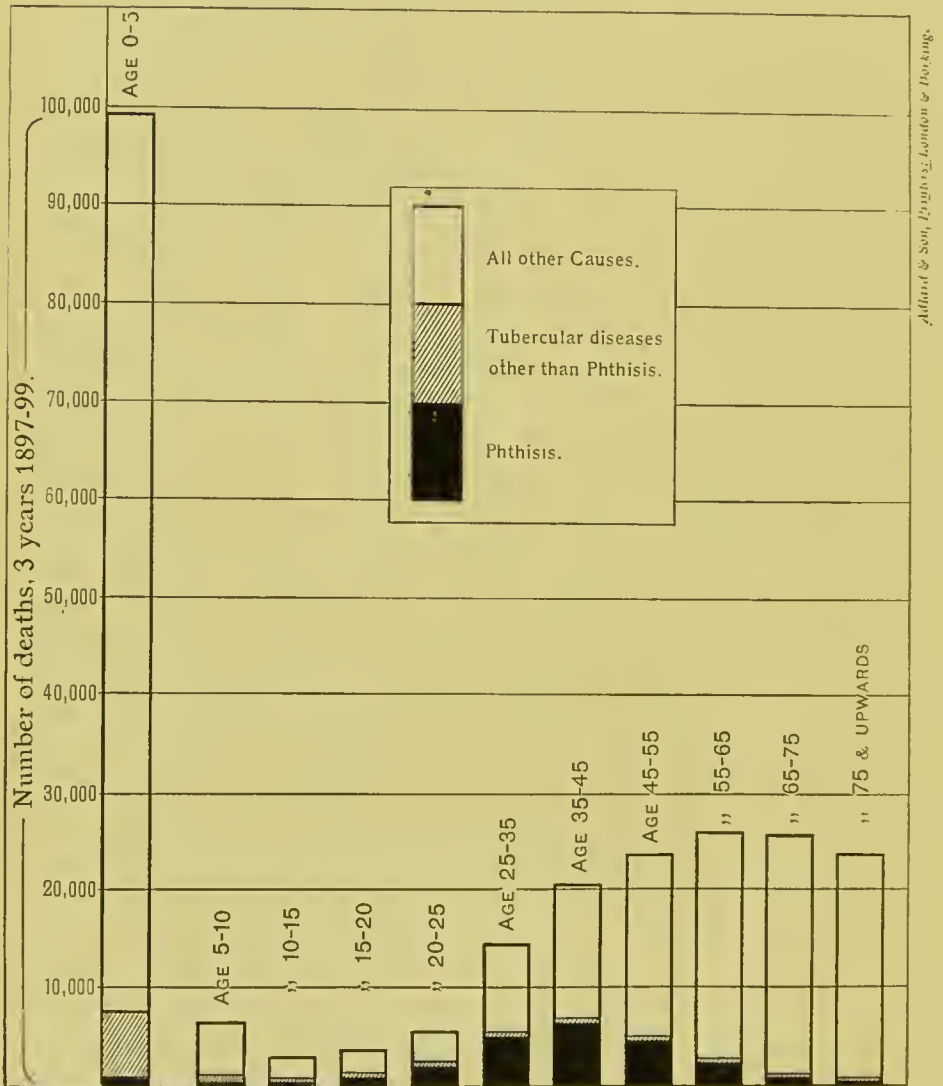
In some cases the disease develops rapidly like an acute infective disease, and very frequently, as will be seen in some of these specimens, the bacilli are arranged in large colonies in a manner similar to the common appearance of the *Bacillus lepræ* in the human tissues. Inoculation into other animals was not always adopted, but in all cases the macroscopic post-mortem signs were such as to lead to a diagnosis of tuberculosis. All the specimens are similarly stained (carbol-fuchsin).

- | | |
|----------------------------|---------------------------|
| 1. Guan (kidney). | 13. Francolin (liver). |
| 2. Quail (liver). | 14. Goose (lung). |
| 3. Rhea (liver). | 15. Goose (liver). |
| 4. Rhea (spleen). | 16. Eland (lung). |
| 5. Ostrich (liver). | 17. Monkey (lung). |
| 6. Ostrich (lung). | 18. Cat (liver). |
| 7. Curassow (heart). | 19. Golden eagle (liver). |
| 8. Trumpeter swan (liver). | 20. Fowl (liver). |
| 9. Black cuckoo (liver). | 21. Pheasant (liver). |
| 10. Vulture (gland). | 22. Parrot (lung). |
| 11. Vulture (liver). | 23. Horse (lung). |
| 12. Francolin (spleen). | |

DIAGRAM I.

LONDON, 1897-99.

Diagram showing the relation of deaths from tuberculous diseases to total deaths from all causes at each age-period.



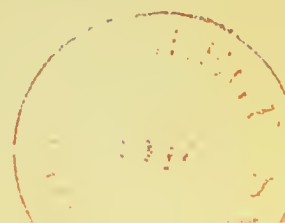


DIAGRAM II.

LONDON, 1897-99.

Diagram showing the proportion of deaths from tuberculous diseases per 100 deaths from "all causes" of each age-period.

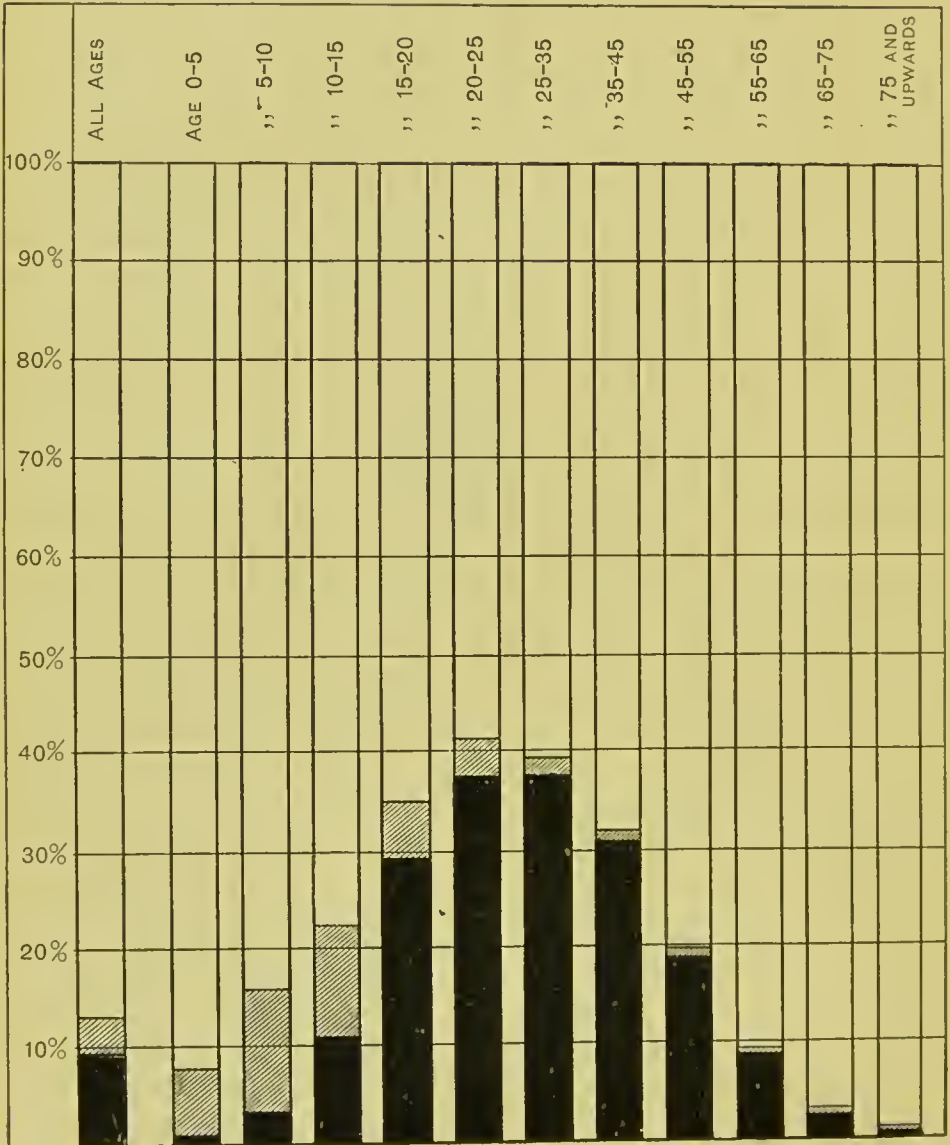
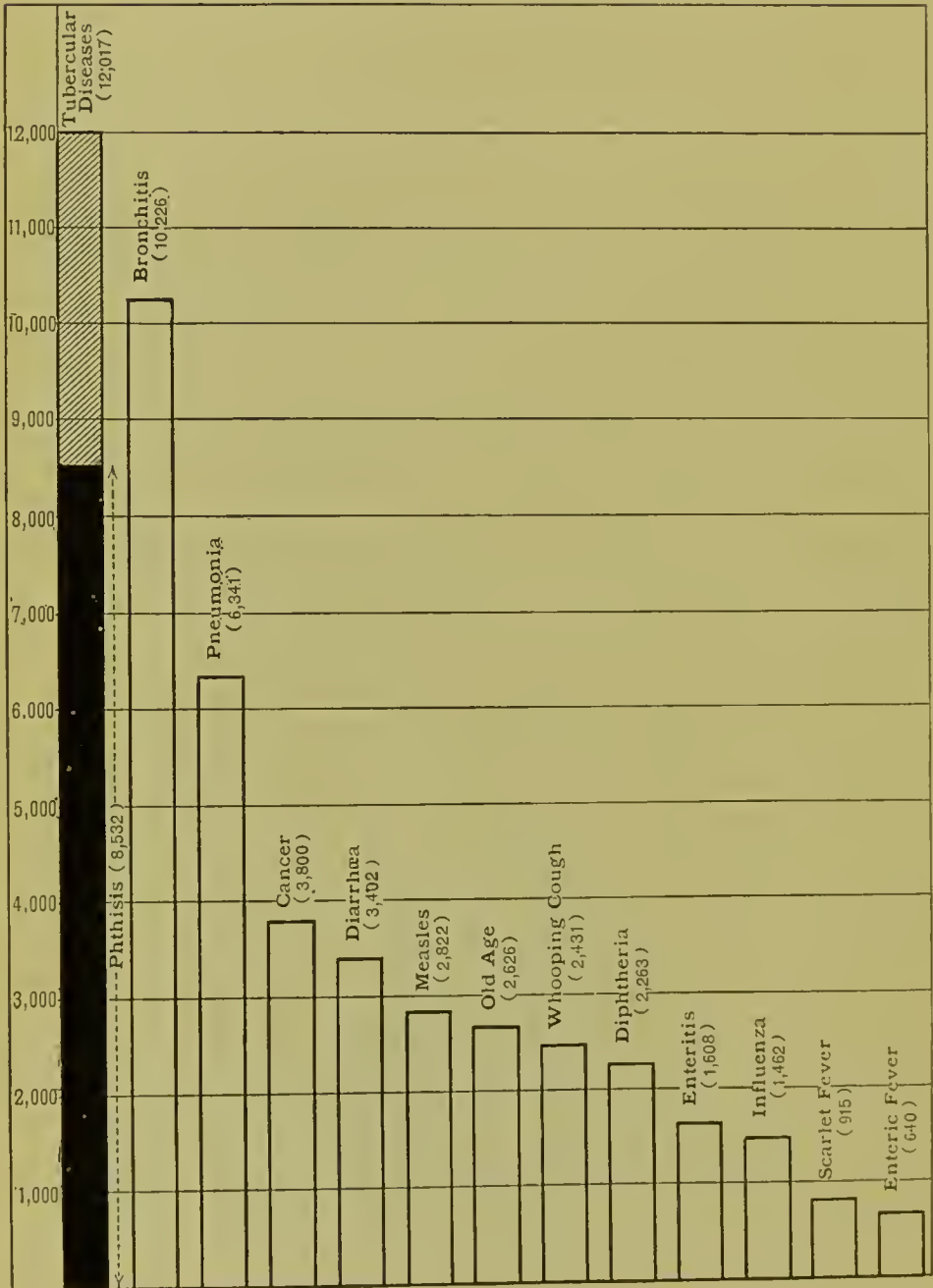


DIAGRAM III.

LONDON, 1890—99.

Diagram showing the number of deaths per annum occurring in London at "all ages" from the principal causes of death, 1890—99.



STATISTICS

RELATING TO THE

CAUSATION, DISTRIBUTION, AND MORTALITY OF TUBERCULOSIS.

XXX. DIAGRAMS AND CHARTS SHOWING THE IMPORTANT PROPORTIONS WHICH DEATHS FROM TUBERCULOUS DISEASES FORM OF TOTAL DEATHS IN LONDON, AND THE RELATION OF MORTALITY FROM TUBERCULAR DISEASES TO OVERCROWDING.

By SHIRLEY F. MURPHY.

Medical Officer of Health of the Administrative County of London.

DIAGRAM I shows the proportion of deaths in London (1897-99) from tubercular diseases to the total deaths from "all causes" at the several age-periods of life. It will be seen that the greatest number of deaths from tubercular diseases occurs at ages 0-5, although in comparison to the total deaths from "all causes" at this age-period the number is relatively small, viz. about 8 per cent. The ages at which deaths from tubercular diseases form the largest proportion of total deaths are 20-25 and 25-35, viz. 41 per cent. and 39 per cent. respectively, and it will be seen from the diagram that nearly the whole of the tubercular mortality at these ages is attributable to phthisis, whereas at the age-period 0-5 the deaths from phthisis form but a small proportion of the deaths from tubercular diseases.

DIAGRAM II has been constructed to enable the *relative* mortality from phthisis and other tubercular diseases to be more clearly appreciated; this diagram is based upon the same facts as diagram I, the deaths from phthisis and other tubercular diseases being shown as a percentage of the total deaths due to "all causes" at each age-period. This diagram clearly illustrates the large extent to which the mortality at the working period of life, viz. 15-55, is influenced by tubercular diseases.

DIAGRAM III enables comparison to be made between the mortality in

London (1890-99) at "all ages" from tubercular diseases and the mortality from other important causes of death.

DIAGRAM IV (which may be studied in conjunction with diagram II) enables similar comparison to be made for the age-period 20-40; the relative insignificance of other causes of death compared with tubercular diseases is here very apparent. Tubercular diseases account for more than one third of the mortality at this age-period, and it will be seen from the diagram that the mortality from pneumonia (which, excluding tubercular diseases, is responsible for the greatest number of deaths at this age-period) is only about one fourth of the mortality from tubercular diseases.

CHART A is a map of London showing the sanitary districts as constituted prior to the London Government Act of 1899. This map has been prepared to show six degrees of "overcrowding" in different parts of London, viz. districts with under 12 per cent. of the population overcrowded; districts with 12-16 per cent. overcrowded, up to districts with 28 per cent. and upwards of the population overcrowded. The portion of the population included under the term "overcrowded" is that portion of the population which was shown by the census of 1891 to be living more than two in a room, in tenements of less than five rooms.

CHART B is a similar map of London, showing variations in the incidence of phthisis mortality on London sanitary districts. These districts have been divided into six groups, distinguished on the map by six shades, viz. districts with under 1.20 deaths per 1000 living, thence by gradations of 15 per cent. of the mean to districts with 2.22 deaths and upwards per 1000 living (black). It is interesting to observe the correspondence between the two charts A and B, and the close relation which apparently exists between the amount of "overcrowding" in a district and the amount of phthisis mortality. It should be pointed out, however, that the population which is badly housed suffers from other consequences of poverty than insufficiency of dwelling accommodation. But however much these other conditions may contribute to the production of phthisis, there is ample reason for thinking that the dwelling itself, and the manner in which it is occupied, are important factors in determining the prevalence of this disease. It is interesting to consider in this connection the measures which are now in the main relied upon for the cure of phthisis. They consist in the placing of the patient by night and by day under conditions which are mostly widely different from, and, indeed, are directly opposed to, those which obtain in the overcrowded tenement. In so far as these measures are successful in effecting the cure of phthisis, the overcrowded dwelling must be deemed to promote the disease, and hence the effects of overcrowding upon phthisis mortality may be understood.

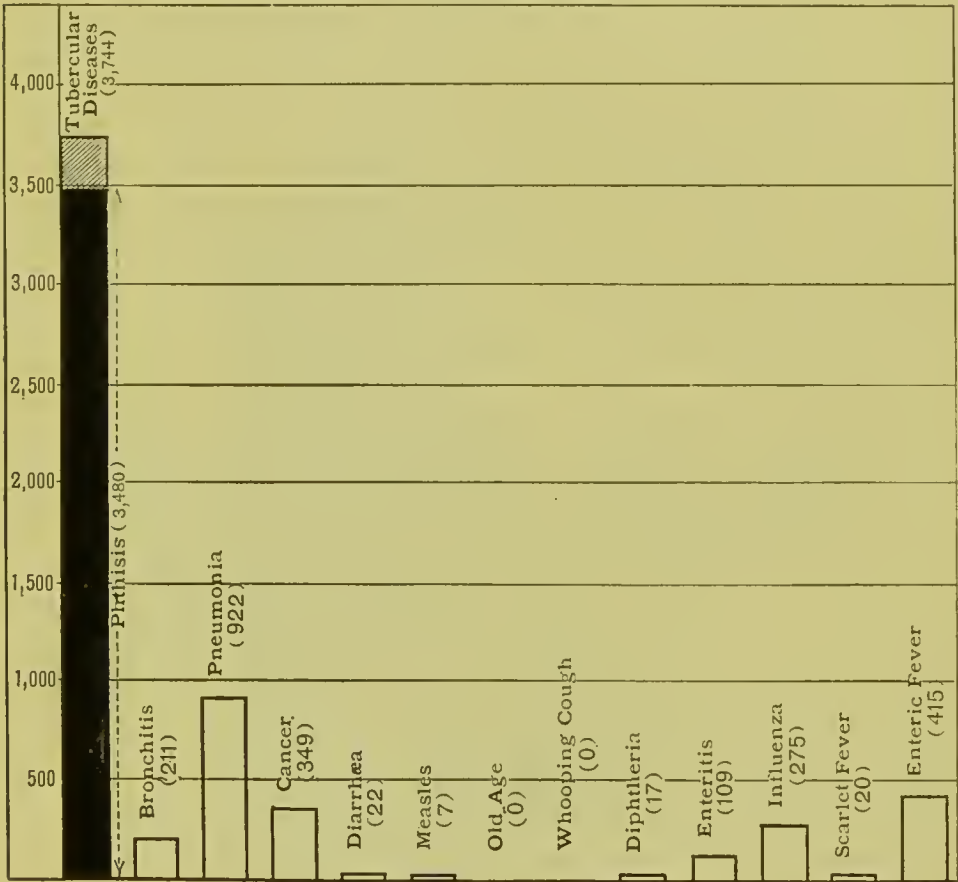
Mortality and Overcrowding.

The census of 1891 shows the number of persons occupying less than five rooms in the several sanitary districts, and from the figures given it is possible

DIAGRAM IV.

LONDON, 1900.

Diagram showing the number of deaths occurring in London at ages 20-40 from the principal causes of death, 1900.



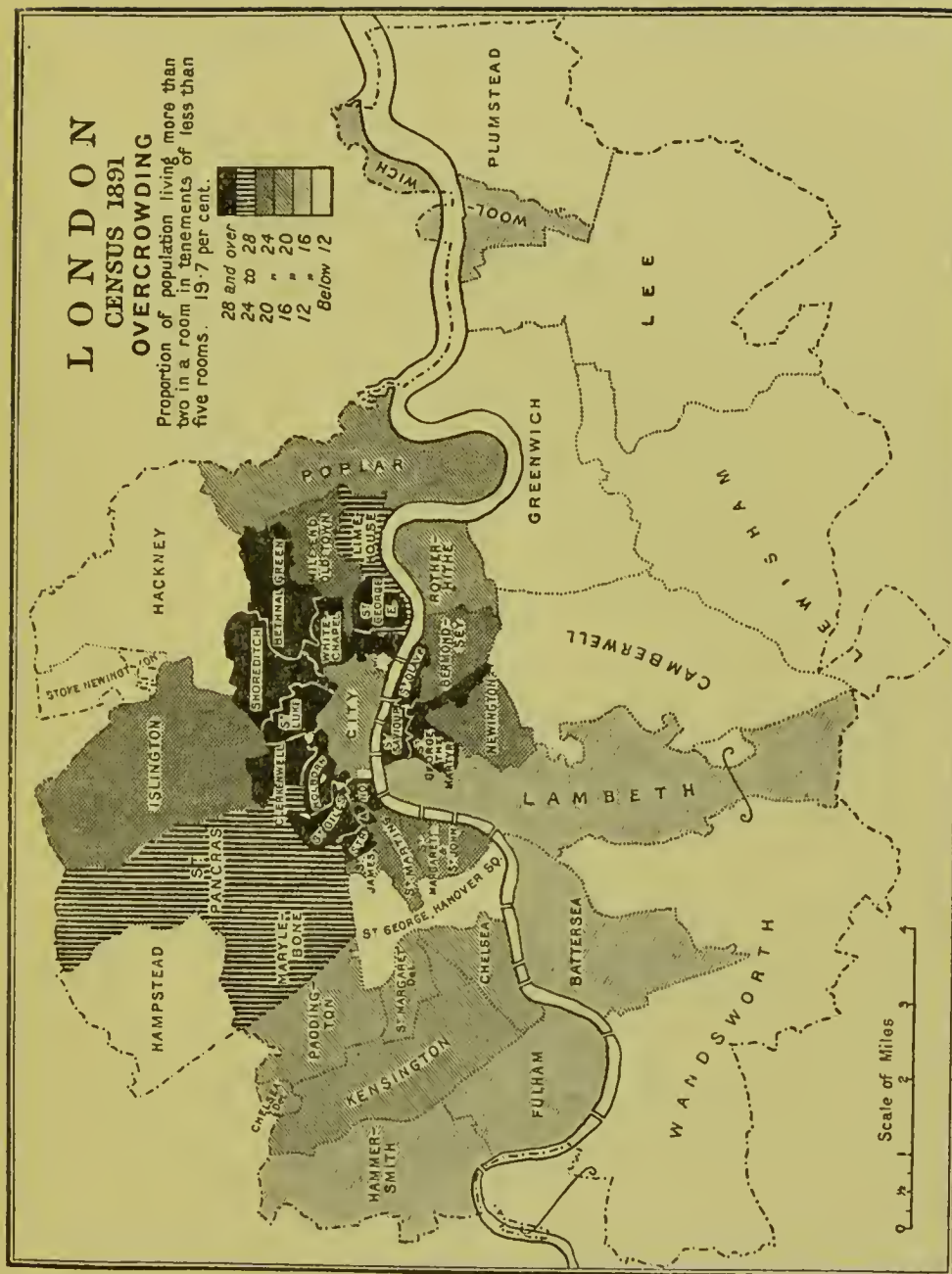
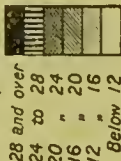
Adlard & Son, Printers: London & Dorking.



LONDON

CENSUS 1891 OVERCROWDING

Proportion of population living more than two in a room in tenements of less than five rooms. 19.7 per cent.



Scale of Miles

LONDON

CENSUS 1891

OVERCROWDING

Proportion of population living more than two in a room in tenements of less than five rooms. 19.7 per cent.

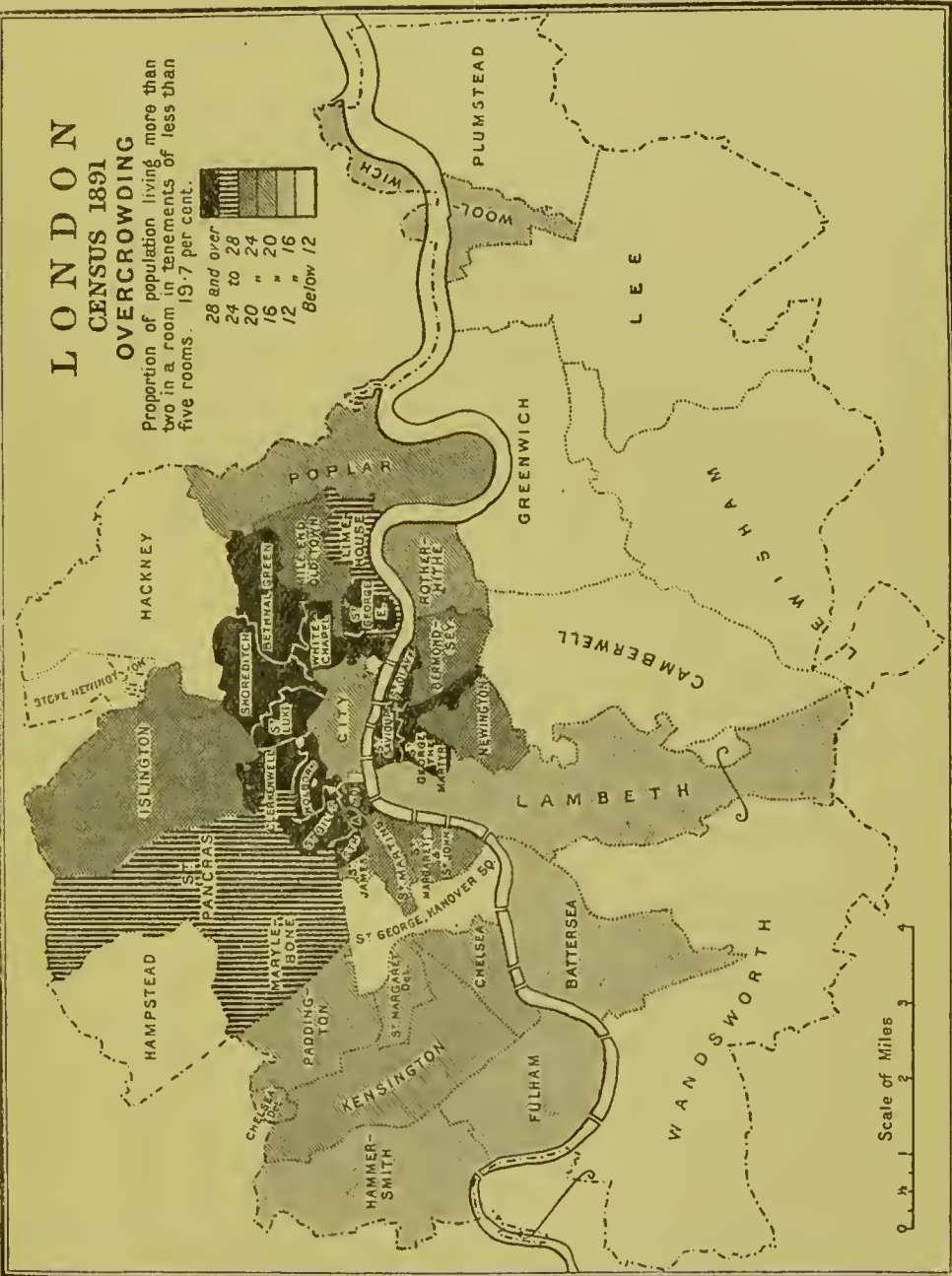
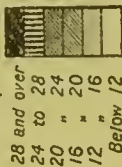
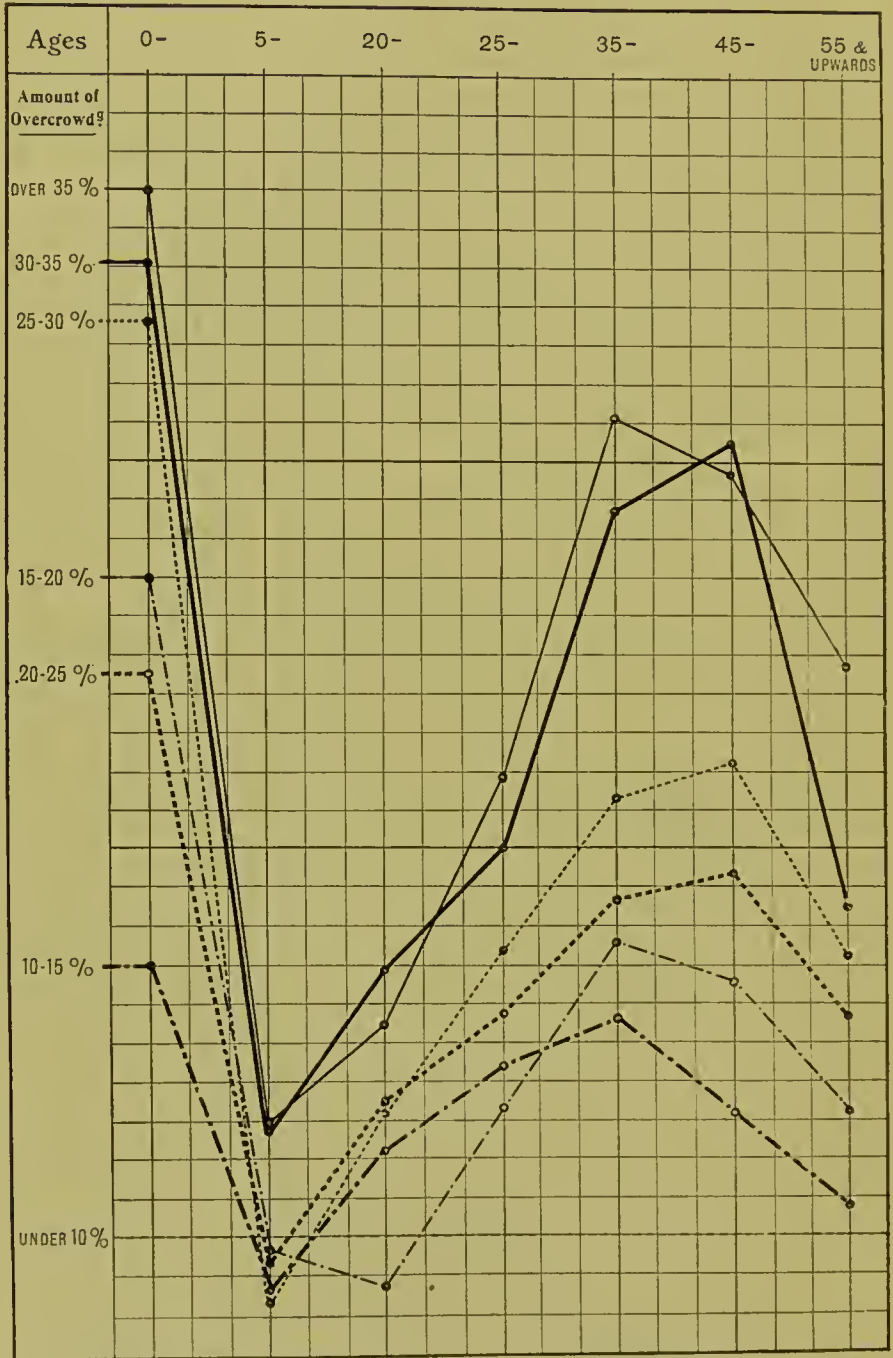


DIAGRAM V.

LONDON, 1898.—PHTHISIS AND OVERCROWDING.

Diagram showing comparative death-rates from phthisis at certain age-periods in groups of London sanitary districts, arranged with respect to their condition as to overcrowding.



to calculate the proportion of the population of each district occupying tenements of one, two, three and four rooms in which there were more than two persons to a room. Employing the term "overcrowding" to represent such usage and grouping the various districts in accordance with the proportion of "overcrowding" shown by the census figures of 1891, it will be seen that the phthisis death-rates in these groups of districts follow the order of overcrowding. The following table shows the results obtained for each of the years 1894-98 inclusive :

Phthisis, 1894-98.

Proportion of total population living more than two in a room (in tenements of less than five rooms).							Death-rates per 1000 living.				
							1894.	1895.	1896.	1897.	1898.
Districts with under 10 per cent.	...	...	...	...	...	...	1'07	1'18	1'07	1'14	1'10
" " 10 to 15 "	...	...	...	...	...	...	1'38	1'49	1'46	1'42	1'43
" " 15 to 20 "	...	...	...	...	...	...	1'57	1'64	1'61	1'63	1'61
" " 20 to 25 "	...	...	...	...	...	...	1'81	1'83	1'67	1'75	1'80
" " 25 to 30 "	...	...	...	...	...	...	2'11	2'09	2'06	2'10	2'07
" " 30 to 35 "	...	...	...	...	...	...	2'26	2'42	2'13	2'32	2'42
" " over 35 "	...	...	...	...	...	...	2'46	2'66	2'55	2'64	2'63

There is, therefore, obviously relation between the amount of overcrowding and the phthisis death-rate. The figures do not, however, suffice to show whether the overcrowding caused phthisis, or whether the disease by adding to family expenditure or by diminishing the wage-earning power left less money available for rent, and thus brought about the overcrowding, or whether again overcrowding is associated with some other condition or conditions which are favourable to disease. In all probability all these circumstances have tended to produce the results shown in the table.

Study of the following tables shows that the phthisis mortality at each age increases with overcrowding. The differences in the death-rates at age 5—in the several groups of districts are small, but with slight exception the death-rates at the older ages follow the order of overcrowding. It is interesting to observe that the differences between the death-rates of the several groups of districts are most marked at the ages at which the mortality from phthisis is greatest. This will be more clearly seen on reference to diagram V, which is based upon the table showing the comparative death-rates at each age-period for each of the groups of sanitary districts compared with the least overcrowded group. In the diagram the death-rates obtaining in the least overcrowded group of districts are represented by the dotted lines, the death-rates obtaining in the other groups of districts being represented by curves. The distance of each point of these curves above or below the dotted line represents the increase or decrease per cent. in the death-rates obtaining for the particular group of districts dealt with, above or below the corresponding death-rates

obtaining in the least overcrowded group. Each square in the diagram represents 10 per cent.

Phthisis—Death-rates per 1000 living, 1898.

Proportion of total population living more than two in a room (in tenements of less than five rooms).	0—	5—	20—	25—	35—	45—	55 and upwards.
Districts with under 10 per cent. ...	0'23	0'39	1'19	1'50	1'94	2'05	1'77
" " 10 to 15 " ...	0'39	0'34	1'44	2'13	3'09	2'68	1'91
" " 15 to 20 " ...	0'62	0'37	1'05	2'01	3'41	3'43	2'36
" " 20 to 25 " ...	0'57	0'36	1'59	2'39	3'66	4'01	2'78
" " 25 to 30 " ...	0'78	0'33	1'57	2'58	4'16	4'58	3'04
" " 30 to 35 " ...	0'81	0'49	2'00	3'00	5'58	6'26	3'26
" " over 35 " ...	0'85	0'50	1'82	3'25	6'04	6'12	4'41

Phthisis—Comparative death-rates—Death-rates in least overcrowded group at each age-period taken as 100.

Proportion of total population living more than two in a room (in tenements of less than five rooms).	0—	5—	10—	25—	35—	45—	45 and upwards.
Districts with under 10 per cent. ...	100	100	100	100	100	100	100
" " 10 to 15 " ...	170	87	121	142	159	131	108
" " 15 to 20 " ...	270	95	88	134	176	167	133
" " 20 to 25 " ...	248	92	134	159	189	196	157
" " 25 to 30 " ...	339	85	132	172	214	223	172
" " 30 to 35 " ...	352	126	168	200	288	305	184
" " over 35 " ...	370	128	153	217	311	299	249

Two questions deserve consideration—(1) Whether overcrowding is associated in a similar manner with mortality from other diseases than phthisis; (2) Whether the increase of mortality from these diseases in association with overcrowding especially manifests itself at the same ages as in phthisis.

For the purpose of comparison with phthisis the diseases tabes mesenterica, tubercular meningitis, diarrhœa, principal zymotic diseases excluding diarrhœa, and cancer have been selected, together with the mortality from "all causes," and diagram VI has been prepared to show the relative mortality from these diseases in the several sanitary districts in London arranged in order of overcrowding; the dotted lines represent the mean London mortality. The decrease of mortality from phthisis as the line travels from the most to the least overcrowded districts is well marked, and the same, but in less degree, is also seen in the mortality from "all causes." The mortality from tubercular meningitis manifests this fall in much less degree, and that from tabes mesenterica still less. The relation of overcrowding to mortality from diarrhœa and the principal zymotic diseases is not particularly apparent, while

DIAGRAM VI.

LONDON, 1898.

Diagram showing Mortality from certain diseases in relation to Overcrowding.

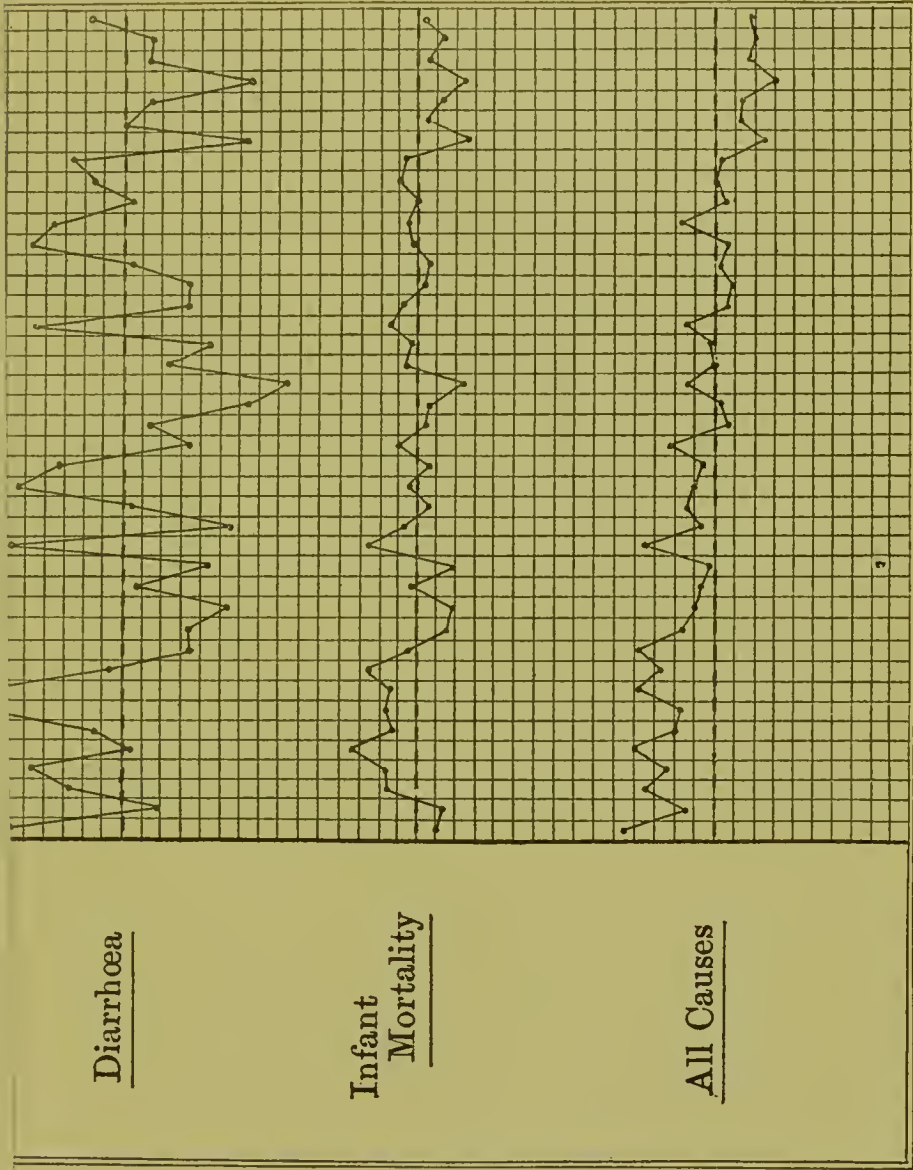
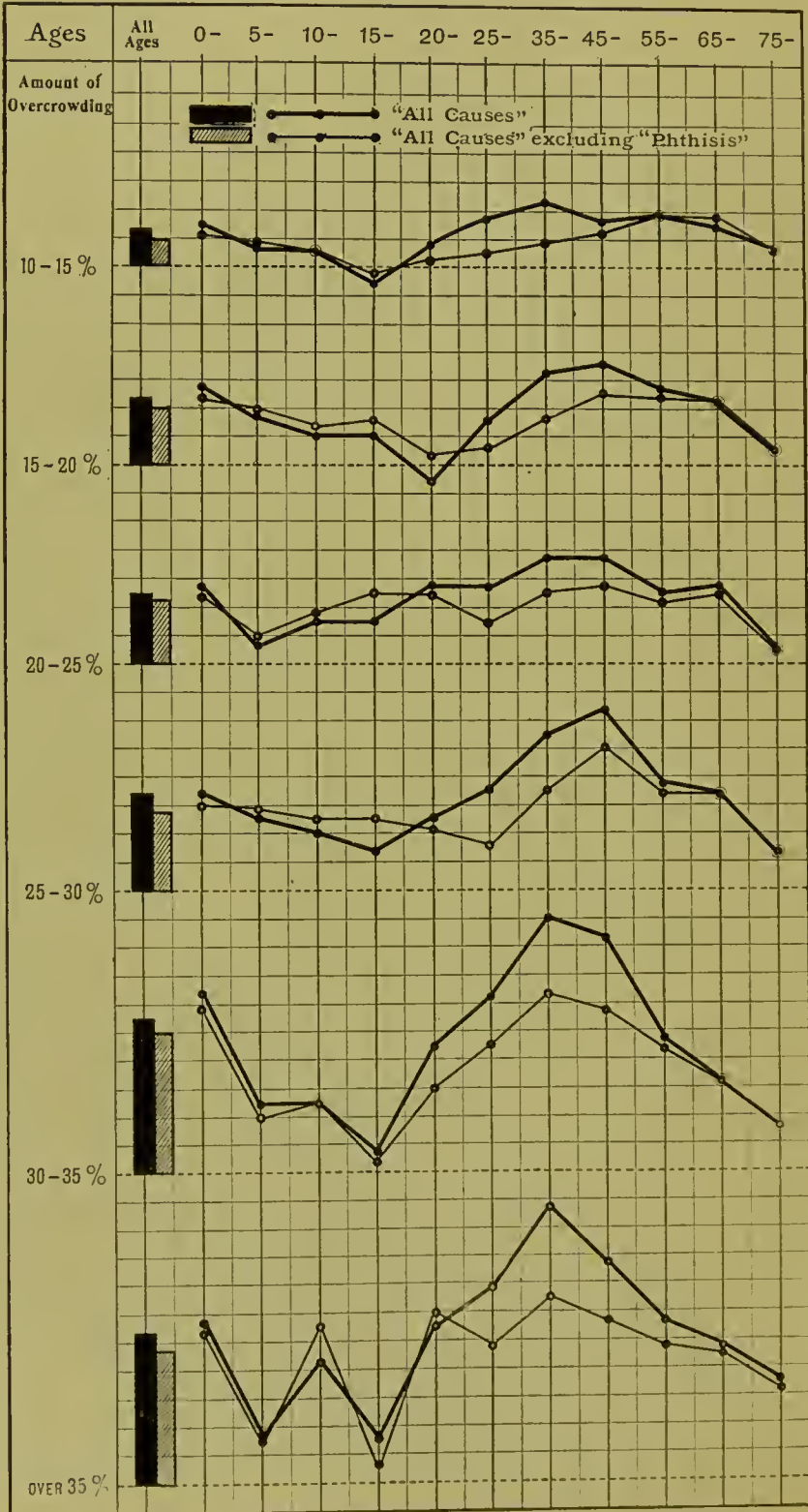


DIAGRAM VII.

LONDON, 1898.—MORTALITY AND OVERCROWDING.

Diagram showing comparative death-rates from "All Causes," and from "All Causes excluding Phthisis," at certain age-periods in groups of London sanitary districts, arranged with respect to their condition as to overcrowding.



the mortality from cancer does not appear to have any relation whatever to overcrowding. There is therefore suggestion that it will be found that, while associated with overcrowding is a tendency of the population to die from disease generally, this tendency is especially manifested in the case of phthisis, and is not manifested in the case of every disease. Probably this difference in behaviour will be found to depend upon differences in causation and age distribution of particular diseases.

The question whether increase of mortality from other diseases than phthisis in association with overcrowding especially manifests itself at the same ages as in phthisis may be considered by reference to diagram VII, which is similar in construction to diagram V. The ages mostly affected in phthisis are 20—25—35— and 45—, and it will be seen that these ages are mostly affected in mortality from “all causes.”

In explanation of this diagram (VII) it may be stated that the London sanitary districts have been arranged, with regard to the amount of overcrowding, into seven groups as in the preceding tables. The death-rates obtaining, at each age-period, for the least overcrowded group of districts—represented in the diagram as a dotted line—have been adopted as a standard of comparison, the death-rates of the more overcrowded groups being represented by curves. The distance of each point of these curves above or below the dotted line represents the increase or decrease per cent. in the death-rates obtaining for the particular group of districts dealt with, above or below the corresponding death-rates obtaining in the least overcrowded group. Each square in the diagram represents 10 per cent.

Two curves are shown in the diagram for each group of districts, one (black) relating to death-rates from “all causes,” the other (red) relating to death-rates from “all causes” exclusive of phthisis. It will be seen that the red curves are very similar to the black, except for the fact that the increase at ages 25—35— and 45— is less conspicuous. That this increase would be less conspicuous in the case of all causes excluding phthisis is, of course, apparent from the behaviour of the figures previously referred to relating to phthisis. The height of the vertical column shows the excess per cent. of the death-rate at “all ages” in each group of districts over that of the least overcrowded group.

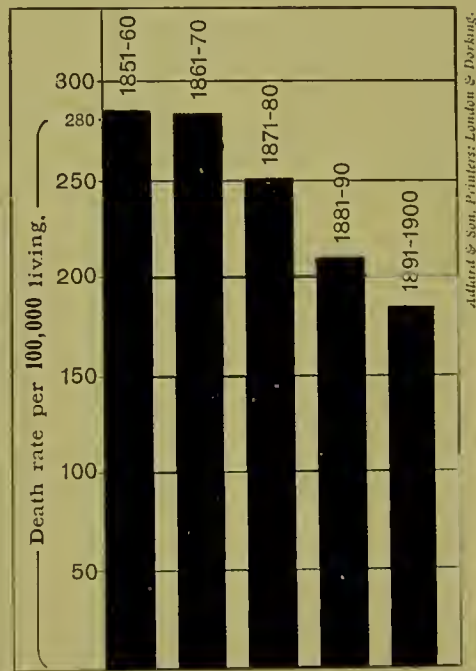
Table of Districts of London, showing the Phthisis Death-rate per 1000 in London in the years 1894-97, corrected for Deaths in Institutions and also the Over-crowding, 1891 (vide Charts A and B).

		Population, Census, 1896.	Percentage of population over- crowded. Census, 1891.	1894.	1895.	1896.	1897.	1894-97.
WEST—								
Paddington	...	124,506	16·81	1·3	1·32	1·27	1·13	1·25
Kensington	...	170,465	17·26	1·5	1·49	1·42	1·44	1·46
Hammersmith	...	104,199	13·44	1·5	1·56	1·40	1·38	1·46
Fullham	...	113,781	14·49	1·4	1·40	1·66	1·54	1·50
Chelsea	...	96,646	18·58	1·6	1·92	1·82	1·81	1·78
St. George, Hanover-square	...	79,967	11·11	1·3	1·32	1·28	1·16	1·26
Westminster	...	53,234	20·85	2·5	2·32	2·24	2·70	2·44
St. James	...	23,050	23·78	2·0	1·50	1·89	2·27	1·91
NORTH—								
Marylebone	...	141,188	26·78	2·0	2·12	1·95	1·75	1·95
Hampstead	...	75,449	10·32	0·9	1·01	1·12	0·74	0·94
St. Pancras	...	240,764	27·62	1·9	1·79	1·93	2·01	1·90
Islington	...	336,764	20·25	1·5	1·60	1·45	1·44	1·49
Stoke Newington	...	33,485	10·83	1·2	1·12	0·82	1·17	1·07
Hackney	...	213,044	10·83	1·4	1·49	1·41	1·43	1·43
CENTRAL—								
St. Giles	...	38,237	29·80	3·1	3·31	2·91	2·99	3·07
St. Martin-in-the-Fields	...	13,077	19·82	2·5	1·81	1·97	2·60	2·22
Strand	...	23,782	30·95	3·2	3·16	2·89	3·36	3·15
Holborn	...	31,208	38·08	2·4	3·13	3·24	2·76	2·88
Clerkenwell	...	66,202	38·78	2·3	2·41	2·16	2·35	2·30
St. Luke	...	41,527	44·24	2·8	2·72	2·92	3·11	2·88
London, City of	...	30,970	19·18	2·0	1·56	1·60	1·89	1·76
EAST—								
Shoreditch	...	122,348	33·68	2·2	2·31	1·87	2·03	2·10
Bethnal Green	...	129,162	34·23	1·8	1·90	1·80	1·98	1·87
Whitechapel	...	77,717	43·50	2·6	2·81	2·40	2·52	2·58
St. George-in-the-East	...	47,506	39·83	2·3	2·40	2·56	2·76	2·50
Limehouse	...	58,305	25·76	2·4	2·34	2·24	2·55	2·38
Mile End Old Town	...	111,060	22·00	1·8	1·65	1·38	1·40	1·55
Poplar	...	169,267	17·83	1·7	1·62	1·75	1·88	1·73
SOUTH—								
St. Saviour, Southwark	...	25,365	32·37	2·9	3·28	3·11	3·22	3·12
St. George, Southwark	...	60,278	33·59	2·8	3·10	2·69	2·52	2·77
Newington	...	120,939	22·26	2·0	2·20	1·99	2·21	2·10
St. Olave	...	11,731	29·10	2·5	2·70	2·19	2·88	2·56
Bermondsey	...	85,475	23·30	2·2	2·23	2·03	2·04	2·12
Rotherhithe	...	40,379	18·00	1·6	1·90	2·19	1·58	1·81
Lambeth	...	295,033	15·87	1·6	1·76	1·63	1·67	1·66
Battersea	...	165,115	14·20	1·4	1·52	1·44	1·49	1·46
Wandsworth	...	187,264	5·57	1·1	1·17	0·97	1·14	1·09
Camberwell	...	253,076	11·10	1·4	1·58	1·54	1·50	1·50
Greenwich	...	175,774	11·17	1·4	1·54	1·57	1·48	1·49
Lewisham	...	104,521	3·59	1·1	0·87	1·01	0·90	0·97
Woolwich	...	41,314	14·45	1·9	2·24	2·09	1·91	2·03
Lee	...	38,588	6·43	1·1	1·47	1·27	1·19	1·25
Plumstead	...	59,252	6·43	1·1	1·55	1·35	1·56	1·39
LONDON	...	—	19·70	1·7	1·77	1·68	1·71	1·71

DIAGRAM VIII.

LONDON, 1851-1900.

Diagram showing deaths from Phthisis per 100,000 living in successive decennia.



Adlard & Son, Printers: London & Dorking.

Diagram VIII illustrates the gradual decline in the mortality attributed to phthisis which has occurred in London during the last half-century. It will be seen from this diagram that this decline has been fairly constant, and a comparison of the figures for the period 1851-60 with those of 1891-1900 shows that the mortality in the latter period is more than 35 per cent. below that of the former period.

That this decline cannot be attributed in any material degree to the altered age constitution of the London population will be apparent when it is stated that persons aged 15-55 years, *i. e.* the ages most susceptible to phthisis, formed the following proportions of the total population in successive census years :

1851	...	...	...	...	59·3 per cent.
1861	...	...	...	...	58·0 „
1871	...	...	...	...	57·7 „
1881	...	...	...	...	57·3 „
1891	...	...	...	...	58·2 „

It is impossible to state to what degree the comparative value of the London figures has been affected by the increasing use of hospitals and other institutions for the treatment of phthisis, or by the migration from London of persons suffering from this disease, whose deaths occur elsewhere, but it is instructive in this connection to note that the decline in phthisis mortality is equally apparent when the figures for England and Wales as a whole are considered.

XXXI. MAPS, CHARTS, AND TABLES ILLUSTRATING THE ASSOCIATIONS OF PHTHISIS IN ENGLAND.

By SIR HUGH BEEVOR, BART., M.D.

What disease, what branch of hygiene, what social custom even, may not be advantageously considered in relation to tuberculosis? So varied and so extensive is the field of influences, it becomes requisite in following but a single influence to trace its effects over a wide area, testing it by many instances. To enable this to be done, I have collected some facts published by the Registrar-General, and burdened the page with an analysis of nearly half a million deaths, arranged under nearly a thousand headings,—the age and sex rates of all the registration counties in England and Wales from 1881 to 1890.

Table 1 and Table 2.

If we know the prevalence of any single cause we are investigating, this table affords a convenient means of testing the constancy of its application to the phthisis death rate. It is abundantly evident that increase or decrease may be

seen from place to place confined to certain periods of life, which increase or decrease would be obscured if an all-ages rate alone was inspected. For example, the two healthiest counties declare this mortality per 10,000 :

	Persons.	All ages.		Age 0—25.		Age 26 and over.
Herefordshire ...	125	{ M. 120	...	64	...	186
		{ F. 129	...	90	...	166
Worcestershire ...	120	{ M. 134	...	55	...	236
		{ F. 106	...	67	...	152

The several influences of (1) the density of population, (2) mortality of population, (3) average agriculturist wage, (4) overcrowding in the house may in turn be considered. We may note the association of the rise and fall of these influences, and the rise or fall of phthisis rate in these two healthiest counties. Again, for two counties least healthy as regards phthisis, viz. Lancashire and North Wales, charts are given allowing easy comparison ; these again in age and sex incidence seem to be governed by similar influences, though suffering to so far greater an extent.

Charts 1 and 2.

Extending our comparison of Herefordshire with Worcestershire, and to North Wales with Lancashire, that is to say rural with urban populations, it is a rule that the rural population has a higher rate during youth, a lower rate in advanced age.

Good and bad influences are effective in the towns, the most conspicuous of which may be thus stated :

(a) As the wages rise, phthisis rate falls ; this fall affects especially the young ; it is due to food-supply.

See also **Charts A and B** in statistics relating to London. Exhibit No. XXX.

(b) As the house accommodation falls the phthisis rate rises ; this rise affects especially the old ; it is due to the inefficient air-supply, and also often to poverty.

(c) As indoor occupation predominates the phthisis rate rises, so men suffer most in towns, women in the country.

These fluctuations of food and air-supply do but overlie that age curve depending upon a profound physiological power of resistance, which in phthisis, as in other specific diseases, controls the age incidence. A most constant age incidence of this nature must be borne in mind, also, a comparative immunity of children after the first year of life, and one varying with either sex according to their rate of development, or to more profound differences in sex constitution visible even after adult life.

Maps D and F.

1. The maps of density of population and of phthisis show us that the malady is not distributed now as it was when Hirsch truly stated "as a general rule phthisis is commoner in towns" ; up to middle life the contrary is the common experience ; it is still frequently true of later life.

Maps C and E.

2. All-cause mortality map coincides with that of density of population. Death rate in the towns rising so much at either extreme of life, this form of incidence depreciates the value of the death ratio map, for although these maps are drawn from standard populations, a great rise of death rate at the ages when phthisis is least prevalent has an exaggerating effect. Accordingly there has been added a table giving the proportion of deaths at age 25 to 35, which still shows a high rural ratio of phthisis deaths to all deaths.

Table 2.

3. The table of the agricultural labourers' wage cannot be taken to indicate the prosperity of the county, except in the more agricultural counties; it is evident even in these that there are further factors often of greater influence.

4. Overcrowding of the house explains the excess of phthisis rate in all the densely populated counties, which have a phthisis rate above the mean rate, except Lancashire, which is not above the mean for overcrowding.

The rainfall of England and damp weather falls upon the western seaboard counties most. There are no data that inform us of the comparative use and disuse of alcoholic drinks.

Charts 3, 4, 5, 6; Tables 3 and 4.

Comparing England and Wales of 1861 to '70 with the England and Wales of 1891-95, we may note a very great improvement, and a general improvement, but an unequal one. This inequality is in age and sex like that now seen existing between urban and rural districts. The social wellbeing seems more suited to account for the improvement than urban hygiene; the improvement anticipated any conscious crusade against tuberculosis.

The charts and tables show that from the decennium 1861-70 to the years 1891-5—

1. The phthisis rate steadily fell. The average income steadily rose.
2. Age incidence. The rate fell much more in the young than in the old.
3. Sex incidence. After adult life the rate fell far more in women than in men.
4. All-cause mortality fell almost proportionately at early ages; it did not fall after age fifty-five.

Uniformity in improvement was the general feature, both of urban and rural counties, but it was noted least improvement occurred where there was much overcrowding of the home. The higher wage can counteract this evil influence but to a very limited extent.

Chart 7; Table 5.

Rural Districts in a County.—To note how regular seem the forces which exact from place to place so proportionate a toll of life in each decade, a reprint

is given of the populations and phthisis rates at age 25 to 45 for the sanitary districts of a very stationary and unprogressive agricultural county.

These forces are not inexorable, as the rate from decade to decade grows conspicuously less. This uniformity emphatically suggests that England should push forward the agencies known to have been so successful in preventing pulmonary tuberculosis in the past. Its efforts in directly combating the bacillus of tubercle should be undertaken with less certain expectations; for here, without history to guide, our knowledge of the biological status and life-history of the bacillus may yet be but partially known. Soil rather than seed seems quite the commanding factor in this table.

The maps and tables added have been reprinted from the 'Lancet,' April 15th, 1899; an oration delivered before the Hunterian Society upon "The Declension of Phthisis;" and from the 'British Medical Journal,' August, 1900, a paper read before Public Health Section at Association Meeting, Ipswich.

DIAGRAM VI.

LONDON, 1898.

Diagram showing Mortality from certain diseases in relation to Overcrowding.

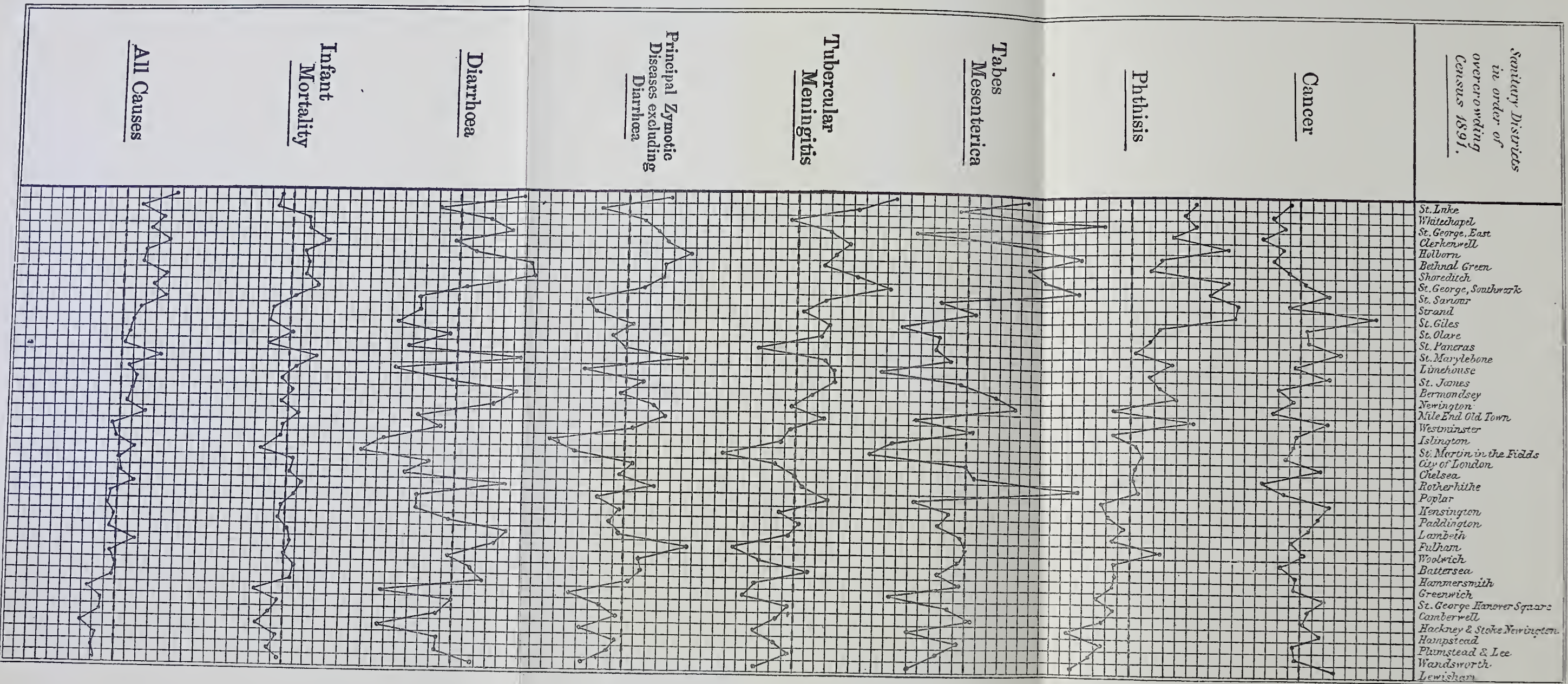


TABLE 2.—*Showing the Mortality per 100,000 in Standard Population, 1881–90 all causes and Phthisis; the Overcrowding, 1891; and Agricultural Labourer's wage, 1898.*

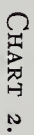
—	Population for 1881–90 in thousands.	All ages.		Proportion per cent. due to phthisis.	Census 1891: population per cent. of overcrowding.	Board of Trade agricultural labourer's wage, weekly, 1898.	—	Population for 1881–90 in thousands.	All ages.		Proportion per cent. due to phthisis.	Census 1891: population per cent. of overcrowding.	Board of Trade agricultural labourer's wage, weekly, 1898.
		All causes.	Phthisis.						All causes.	Phthisis.			
England and Wales ...	27488	1908	172	752	38	—	<i>s.</i>	113	1501	130	660	36	<i>d.</i>
London ...	4211	2142	200	764	41	—	—	254	1551	142	716	41	15 10
Surrey ...	572	1558	156	610	37	19	0	1103	1999	139	724	31	17 11
Kent ...	896	1394	152	669	38	3	19	422	1666	121	604	36	17 1
Sussex ...	531	1494	166	651	44	3	17	801	1925	161	727	37	16 2
Hampshire ...	666	1600	184	777	43	2	16	379	1792	131	634	38	17 2
Berkshire ...	268	1502	149	636	37	5	15	22	1420	136	545	51	—
Middlesex ...	575	1662	139	598	38	6	19	467	1594	152	712	40	17 9
Hertfordshire ...	215	1541	150	656	40	5	16	505	1913	162	722	38	19 2
Buckinghamshire ...	164	1526	135	626	38	5	15	432	1788	143	669	35	19 11
Oxfordshire ...	188	1515	143	623	38	7	14	708	1913	159	763	36	18 0
Northamptonshire ...	308	1621	145	631	39	5	16	3958	2419	192	895	35	19 4
Huntingdonshire ...	50	1394	164	610	49	6	15	2164	2123	183	761	37	18 7
Bedfordshire ...	166	1630	151	646	43	4	16	400	1914	165	786	36	18 6
Cambridgeshire ...	196	1510	173	680	44	6	16	354	1767	150	770	35	18 8
Essex ...	761	1632	147	621	36	5	15	1024	2057	174	775	36	20 9
Suffolk ...	353	1529	180	694	46	6	14	506	2019	209	885	40	20 2
Norfolk ...	460	1558	155	669	39	6	14	266	1795	165	764	37	18 9
Wiltshire ...	255	1495	151	678	44	6	15	66	1432	141	612	39	16 8
Dorsetshire ...	189	1424	142	631	42	5	14	275	1953	145	810	33	16 5
Devonshire ...	636	1656	171	716	42	10	16	965	1924	200	843	39	16 5
Cornwall ...	318	1718	178	673	40	6	16	456	1706	211	876	44	16 5
Somersetshire ...	510	1550	141	661	40	4	15						
Gloucestershire ...	548	1689	151	688	39	6	15						

COUNTIES OF ENGLAND AND WALES, AGE AND SEX INCIDENCE.

TABLE I.—Showing the *Palatist's Mortality per 1000 living in 1881-90. Extracted from Part I., Supplement 55th Annual Report of the Registrar-General. Figures partly taken from Mr. Hutton's Manchester Statistical Society, 1896.*

	Under 5.		5-		10-		15-		20-		25-		35-		45-		55-		65-		75 and upwards.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
London	0.72	0.67	0.25	0.30	0.29	0.53	1.17	1.20	2.26	1.62	3.80	2.59	5.30	3.24	5.47	2.58	4.64	1.82	2.70	1.06	1.14	0.62
Middlesex	0.54	0.56	0.20	0.23	0.28	0.49	0.81	1.02	1.68	1.20	2.41	2.06	3.04	2.24	3.53	1.34	2.93	1.34	2.25	0.79	0.81	0.50
Surrey	0.55	0.47	0.16	0.23	0.27	0.49	0.96	1.28	1.82	1.49	2.86	2.00	3.75	2.39	3.63	2.17	3.41	1.73	2.65	1.17	1.32	0.53
Kent	0.57	0.49	0.25	0.28	0.31	0.65	0.98	1.73	1.94	2.12	2.62	2.50	2.97	2.48	2.88	1.90	2.31	1.45	1.77	0.87	0.57	0.42
Essex	0.51	0.48	0.21	0.25	0.31	0.67	1.00	1.63	1.78	2.03	2.36	2.21	2.87	2.53	2.90	1.98	2.64	1.48	1.93	1.19	0.80	0.43
Sussex	0.46	0.43	0.19	0.26	0.28	0.55	1.06	1.60	2.36	2.07	3.41	2.50	3.77	2.62	3.69	2.02	2.97	1.49	1.66	0.80	0.80	0.17
Hampshire	0.44	0.45	0.19	0.24	0.22	0.56	1.27	1.78	3.03	2.34	4.12	2.93	4.20	2.88	3.66	2.12	2.57	1.47	1.53	1.01	0.59	0.22
Devon	0.66	0.67	0.20	0.29	0.31	0.73	1.27	1.87	2.61	2.61	3.32	2.85	3.14	2.51	2.73	1.38	2.52	1.72	1.79	1.34	0.93	0.43
Cornwall	0.95	1.09	0.17	0.20	0.27	0.83	1.33	2.11	2.72	2.86	2.73	2.76	2.62	2.19	3.62	1.75	4.36	1.67	2.85	1.20	0.77	0.36
Norfolk	0.70	0.62	0.28	0.31	0.29	0.70	1.24	1.98	2.52	2.52	2.60	2.70	2.41	2.44	2.24	1.90	1.97	1.40	1.43	1.00	0.38	0.21
Suffolk	0.53	0.58	0.24	0.32	0.34	0.83	1.31	2.34	2.90	3.10	3.32	3.11	2.86	2.85	2.83	2.08	2.43	1.65	1.36	1.27	0.47	0.52
Cambridge	0.76	0.79	0.21	0.28	0.24	0.77	1.08	2.21	2.70	2.93	3.01	3.04	3.29	2.48	2.72	2.03	2.35	1.44	1.56	0.99	0.56	0.24
Bedford	0.64	0.50	0.20	0.25	0.25	0.80	0.68	1.80	2.02	2.41	2.61	2.94	2.78	2.58	2.64	2.09	1.73	1.50	1.80	0.94	0.24	0.42
South Wales	0.73	0.69	0.37	0.48	0.52	1.10	1.78	2.57	2.86	3.21	3.04	3.57	2.79	3.33	3.01	2.46	3.27	2.02	2.82	1.56	1.17	0.63
North Wales	0.38	0.42	0.32	0.44	0.44	1.12	1.80	3.21	3.44	3.69	3.68	4.00	3.22	3.21	2.84	2.21	2.99	1.90	2.28	1.14	0.70	0.65
Cumberland	0.47	0.38	0.30	0.36	0.37	0.93	1.12	2.12	2.58	2.92	2.61	3.05	2.67	2.64	2.88	1.73	2.55	1.40	1.53	0.82	0.81	0.29
Northumberland	0.53	0.50	0.42	0.58	0.63	1.30	2.06	2.66	3.14	3.02	3.43	3.66	3.59	3.24	3.60	2.35	2.86	1.58	1.69	1.09	0.46	0.42
Durham	0.52	0.48	0.40	0.54	0.64	1.14	1.74	2.31	2.43	3.16	2.42	3.31	2.45	2.88	2.58	2.07	2.29	1.29	1.47	0.63	0.51	0.16
Lancashire	0.59	0.52	0.32	0.37	0.42	0.72	1.54	1.86	2.48	2.46	3.25	3.13	4.14	3.14	4.07	2.35	3.25	1.74	1.86	1.03	0.74	0.51
Cheshire	0.40	0.39	0.24	0.26	0.37	0.60	1.34	1.72	2.37	2.42	2.90	2.73	2.95	2.70	2.96	1.81	2.51	1.39	1.26	0.91	0.75	0.30
West Riding of Yorkshire	0.51	0.48	0.31	0.41	0.44	0.85	1.67	2.32	2.44	2.74	2.80	2.90	3.67	2.53	3.32	1.87	3.45	1.58	2.21	1.10	0.64	0.47
Warwick	0.34	0.30	0.14	0.23	0.24	0.45	1.04	1.34	2.25	1.78	3.12	2.30	4.04	2.53	4.07	1.98	3.44	1.48	1.79	1.01	0.71	0.25
Oxford	0.42	0.41	0.23	0.31	0.20	0.56	0.93	1.48	2.01	1.94	2.64	2.17	2.93	2.39	2.76	1.91	2.04	1.49	1.84	0.69	0.48	0.35
Westmorland	0.43	0.34	0.23	0.20	0.11	0.89	0.86	1.91	2.21	2.76	2.41	2.60	2.12	2.15	2.14	1.51	2.32	1.26	1.84	0.77	0.86	0.15
North Riding of Yorkshire	0.37	0.38	0.24	0.41	0.35	0.92	1.37	1.99	2.28	2.66	2.46	3.05	2.22	2.35	2.17	1.59	1.77	1.21	1.13	0.87	0.56	0.18
East Riding of Yorkshire	0.49	0.51	0.32	0.42	0.48	1.00	1.46	1.93	2.18	2.39	2.73	2.94	3.16	2.77	2.77	1.88	2.29	1.00	1.32	0.67	0.46	0.25
Lincoln	0.37	0.40	0.21	0.36	0.30	0.86	1.18	2.29	2.20	3.03	2.45	3.31	2.36	2.38	1.98	1.56	1.76	1.14	1.13	0.67	0.57	0.35
Rutland	1.29	0.69	0.07	0.29	0.14	1.08	0.63	1.51	2.11	2.66	2.60	3.03	1.39	2.41	1.72	0.66	1.47	0.46	1.45	0.35	0.00	0.00
Stafford	0.53	0.45	0.17	0.23	0.26	0.51	0.90	1.47	1.66	2.01	2.20	2.42	2.99	2.21	2.96	1.76	2.41	1.16	1.47	0.63	0.36	0.21
Derby	0.30	0.34	0.22	0.23	0.33	0.62	1.25	2.09	1.83	2.55	2.20	2.54	2.49	2.26	2.45	1.81	2.20	1.19	1.23	0.96	0.83	0.24
Nottingham	0.52	0.44	0.22	0.34	0.37	0.69	1.44	2.01	2.42	2.83	2.61	3.05	2.85	2.41	2.66	1.78	2.50	1.30	1.59	0.76	0.67	0.53
Leicester	0.40	0.37	0.13	0.21	0.28	0.42	1.06	1.60	2.22	2.08	2.55	2.34	2.64	2.05	2.37	1.44	1.70	0.81	0.81	0.34	0.21	0.11
Salop	0.38	0.38	0.21	0.28	0.21	0.62	0.72	1.77	1.90	2.40	2.95	2.86	2.37	2.12	2.26	1.44	2.13	1.18	1.36	0.80	0.43	0.37
Worcester	0.28	0.22	0.15	0.15	0.18	0.39	0.83	1.27	1.76	1.62	2.45	1.90	2.86	1.79	2.42	1.62	2.11	0.92	1.29	0.63	0.52	0.14
Hereford	0.31	0.39	0.11	0.27	0.21	0.55	1.11	1.64	2.09	2.52	2.29	2.58	2.20	2.21	1.90	1.25	1.57	0.98	0.74	0.52	0.53	0.25
Monmouth	0.69	0.49	0.21	0.32	0.30	0.57	0.98	2.12	1.65	2.55	2.19	3.15	2.19	2.60	1.84	1.68	2.04	1.14	1.29	0.58	0.39	0.23
Northampton	0.71	0.66	0.21	0.24	0.27	0.61	1.12	1.74	2.21	2.10	2.40	2.54	2.66	2.36	2.41	1.50	1.86	1.16	1.35	0.95	0.38	0.48
Huntingdon	0.67	1.00	0.32	0.19	0.10	0.69	0.98	2.12	2.56	3.72	2.71	3.38	2.68	1.81	2.32	1.47	2.24	1.37	1.67	0.90	0.35	0.28
Bucks	0.44	0.52	0.11	0.21	0.13	0.49	0.78	1.38	2.10	1.90	2.50	2.58	2.37	2.49	2.27	1.69	1.82	1.40	0.98	0.93	0.35	0.19
Hertford	0.34	0.37	0.11	0.22	0.22	0.66	0.86	1.79	2.25	2.40	3.03	2.55	3.41	2.16	2.89	1.57	2.45	1.23	1.32	0.74	0.56	0.13
Gloucester	0.49	0.50	0.18	0.27	0.21	0.67	1.04	1.57	2.28	2.10	2.93	2.51	3.13	2.40	2.72	1.87	2.06	1.20	1.34	0.74	0.40	0.34
Somerset	0.29	0.33	0.14	0.20	0.23	0.45	1.05	1.63	2.36	2.34	2.99	2.41	2.88	2.06	2.48	1.56	1.82	1.10	1.08	0.65	0.47	0.24
Dorset	0.40	0.48	0.11	0.15	0.21	0.54	1.07	1.73	2.17	2.50	2.69	2.69	2.38	2.23	2.08	1.69	1.60	1.34	1.49	1.09	0.75	0.45
Wills	0.45	0.50	0.17	0.27	0.27	0.51	0.95	1.56	2.04	2.80	2.89	2.80	2.60	2.33	2.60	1.77	2.05	1.22	1.15	1.00	0.53	0.25
Berkshire	0.73	0.63	0.16	0.24	0.16	0.46	0.83	1.40	2.22	2.18	2.66	2.28	3.10	2.25	3.02	1.71	2.63	1.49	1.80	1.10	0.57	0.52
England and Wales	0.55	0.51	0.25	0.32	0.33	0.69	1.28	1.79	2.32	2.31	3.02	2.78	3.56	2.73	3.49	2.05	2.92	1.51	1.81	0.97	0.68	0.39

PHTHISIS, 1881-90. MALES



PHTHISIS, 1881-90. FEMALES

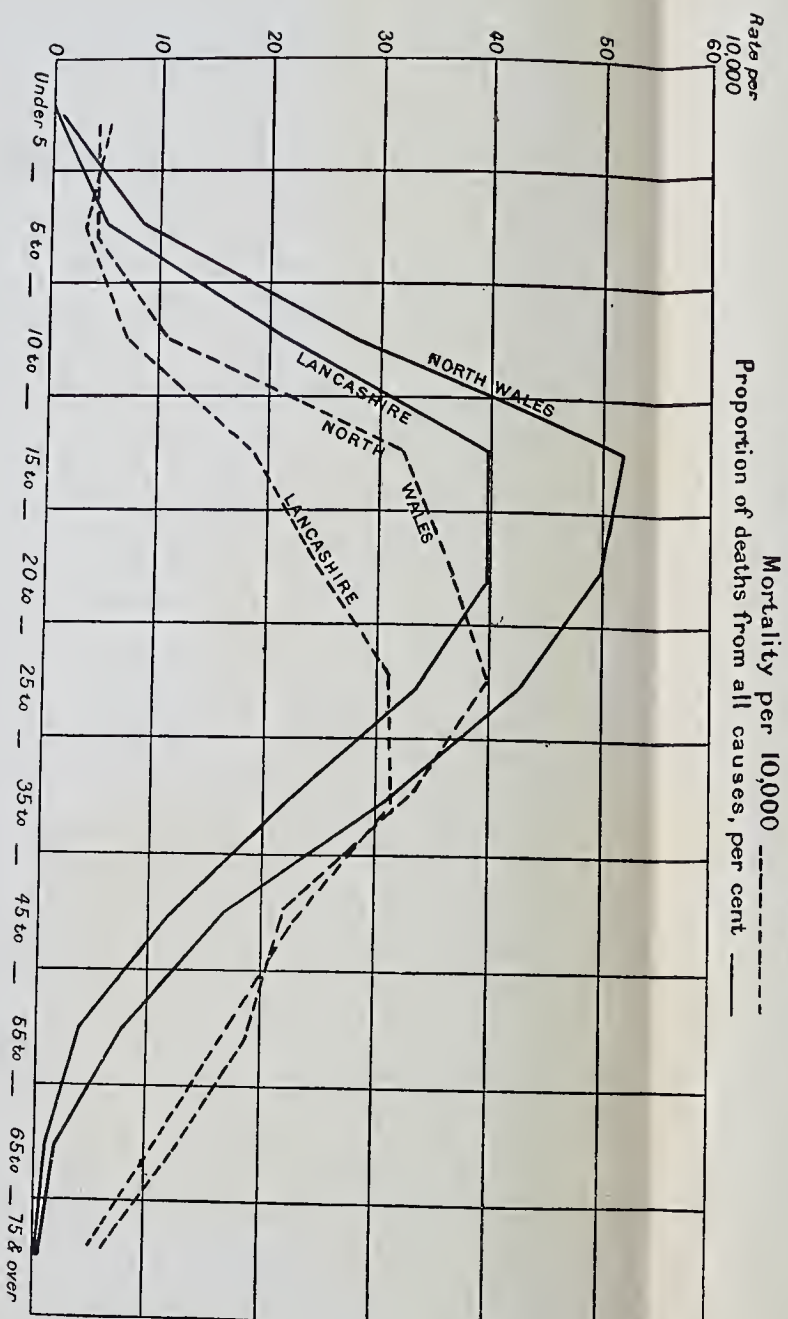


TABLE 3.—*Showing the Declension in the Death rate from Phthisis per 100,000 living in England and Wales.**Males.*

Age in Years.		0—	5—	10—	15—	20—	25—	35—	45—	55—	65—	75 and upwards.
1861-70 ...	... ..	99	43	61	219	388	409	417	386	330	202	66
1891-95 ...	... ..	46	19	26	107	202	254	326	320	268	157	56
Fall of rate to 1891-95, the rate of 1861-70 being taken as 100, that of 1891-95 equals ...	... ..	47	44	41	47	51	61	77	83	78	76	85
<i>Females.</i>												
1861-70 ...	... ..	95	48	105	311	397	438	390	285	207	124	45
1891-95 ...	... ..	42	26	56	142	174	215	230	174	129	80	35
Fall of rate to 1891-95, the rate of 1861-70 being taken as 100, that of 1891-95 equals ...	... ..	44	54	53	45	43	49	59	61	62	64	78

*Proportion per cent. of Deaths from Phthisis compared with Deaths from all Causes.**Males.*

1861-70 ...	... ..	1'35	5'2	13	35	46	41	31	20	10	3	0'4
1891-95 ...	... ..	0'74	4'2	10	26	38	35	26	16	7	2	0'33
Fall in percentage of deaths due to phthisis from 1861-70 to 1891-95, 1861-70 being taken as 100 ...	... ..	54	80	76	72	82	84	83	80	70	66	82

Females.

1861-70 ...	... ..	1'4	6'2	23	47	50	45	32	18	7'3	2'1	0'3
1891-95 ...	... ..	0'8	5'7	20	35	35	32	22	11	4'3	1'2	0'2
Fall in percentage of deaths due to phthisis from 1861-70 to 1891-95, 1861-70 being taken as 100 ...	... ..	56	92	87	74	71	71	68	61	55	60	60

CHART 3.

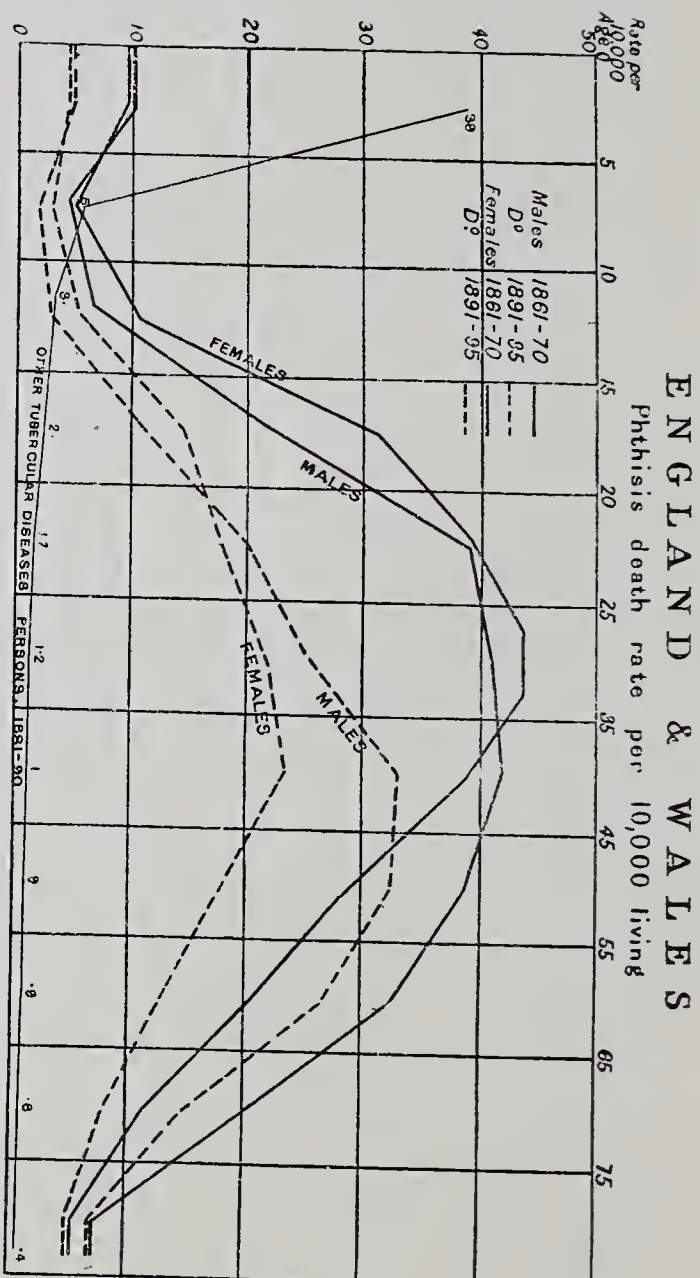


CHART 4.

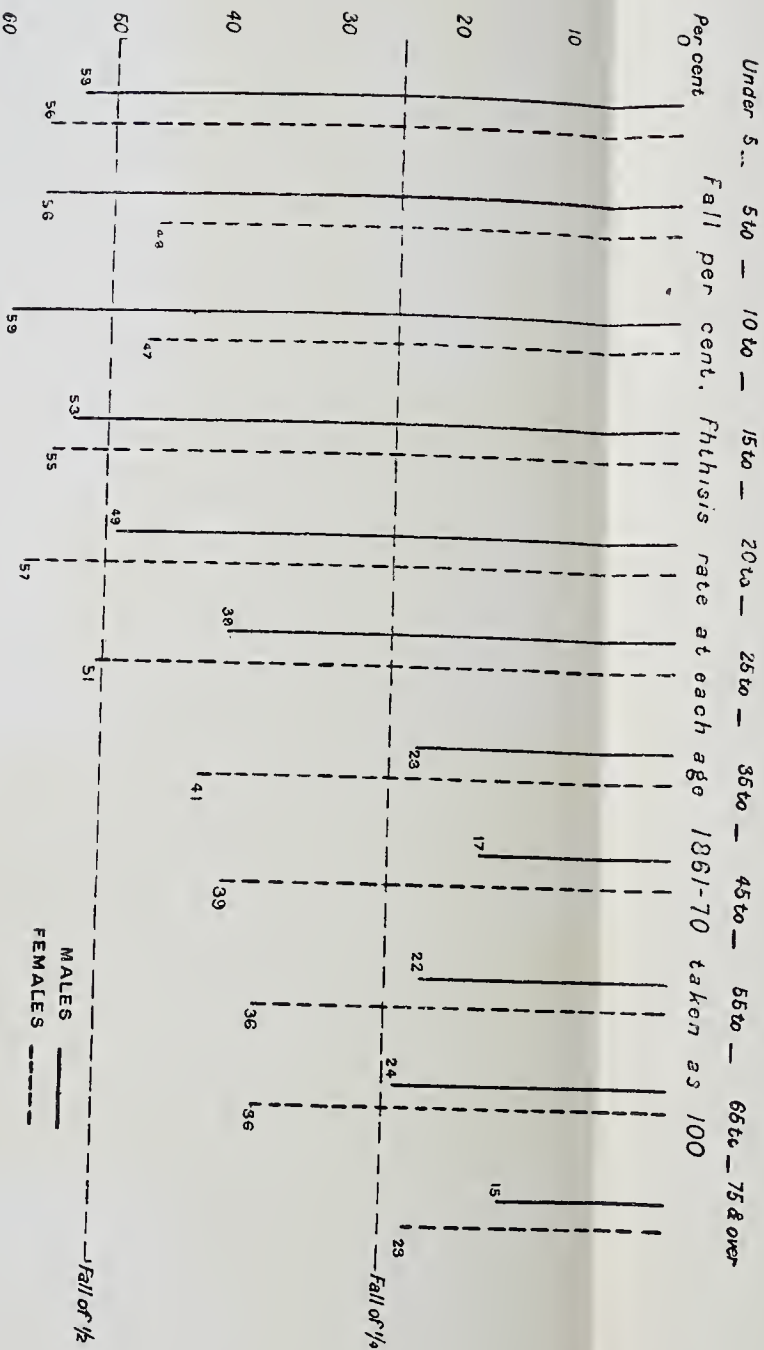


TABLE 4.—*Showing the Phthisis Death rate per 100,000 living in England, the Price of Corn, the Amount of Poor-law Relief, and the Average Wage.*

Date.	Persons (all ages).	0 to 20.	20 to 65.	65 and over.	Price of half- quarter of wheat.	Poor-law relief per 500 living.	Average wage (Bowley).†
1861-65 ...	252 {	M. 101 F. 131 * 130	394 366 93	164 100 67	24s. 27s.	22 21	100 (1860) 113 (1866)
1866-70 ...	244 {	—	—	—	27s.	17	113 (1870)
1871-75 ...	221 {	M. 76 F. 100 * 132	352 289 82	156 88 56	24s.	14	132 (1877)
1876-80 ...	203 {	M. 57 F. 79 * 138	309 241 78	141 70 49	20s. 16s.	13 12	124 (1883) 125 (1886)
1881-85 ...	183 {	M. 48 F. 64 * 133	261 194 74	129 67 52	14s.	11	140 (1891)
1886-90 ...	163 {						
1891-95 ...	146 {						

* Figure representing the female death rate, the male death rate being taken as 100.

† 1860 wage taken as 100.

CHART 5.

ENGLAND & WALES

Phthisis, per centage of deaths from all causes.

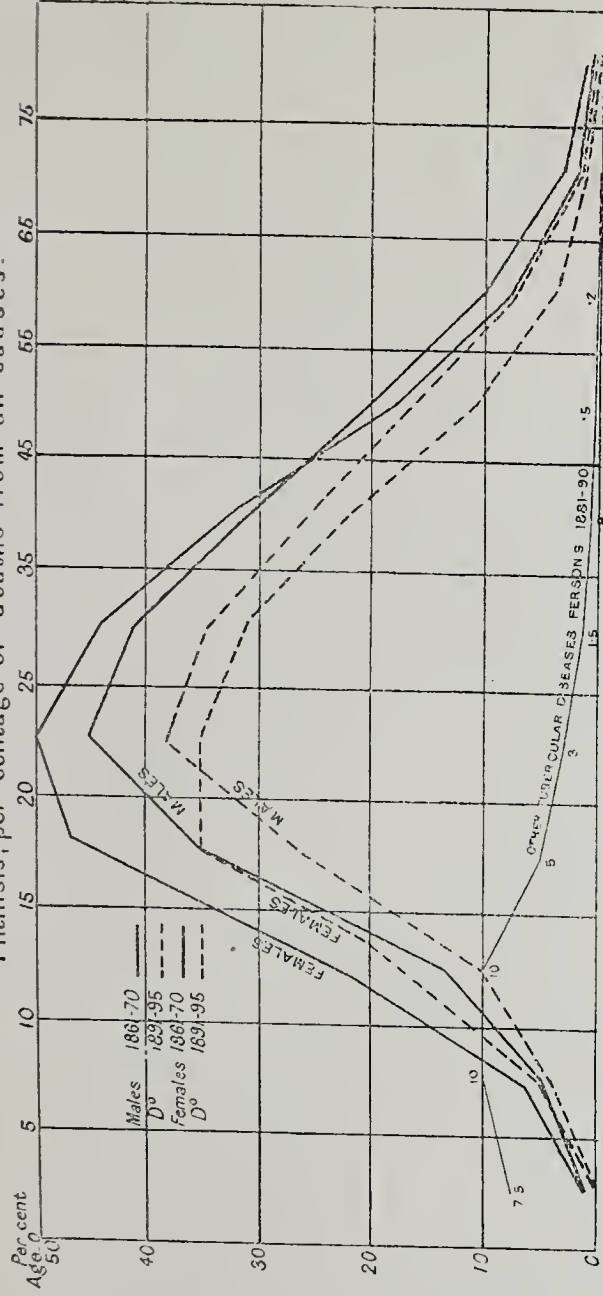


CHART 6.

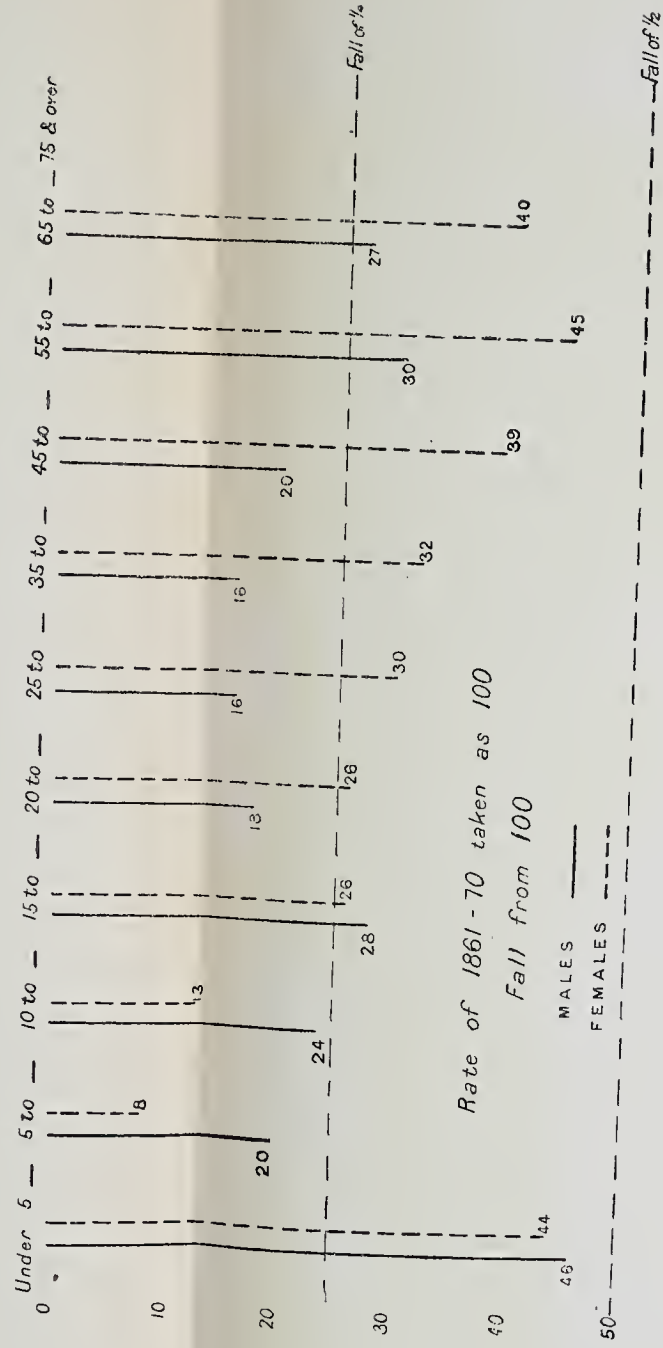


TABLE 5.—*Table showing prevalence of Phthisis in Norfolk Rural Districts, 1861-90.*

	Age 25-35.			Age 35-45.			Rate corrected for Decimia 25-45. See Diagram.	1860-90.
	Population.	Deaths.	Rate.	Population.	Deaths.	Rate.		
Flegg	a 1104	43	3'9	991	26	2'6	3'25	2'8
	b 1136	49	4'4	962	19	2'0	3'15	
	c 1211	31	2'5	984	15	1'5	2'07	
Smallborough	a 1807	93	5'1	1534	47	3'0	4'16	3'2
	b 1712	52	3'0	1516	40	2'6	2'81	
	c 2006	62	3'0	1720	45	2'6	2'86	
Erpingham	a 2496	129	5'1	2318	82	3'5	4'39	3'4
	b 2331	87	3'7	2063	70	3'4	3'57	
	c 2420	63	2'5	1869	40	2'2	2'38	
Aylsham	a 2251	109	4'8	1975	72	3'6	4'27	3'3
	b 2047	80	3'9	1864	46	2'4	3'09	
	c 2143	71	3'3	1786	36	2'0	2'70	
St. Faith's	a 1374	78	5'5	1200	46	3'8	4'81	3'5
	b 1347	52	3'9	1156	31	2'7	3'24	
	c 1473	42	2'8	1251	29	2'3	2'60	
Forehoe	a 1487	77	5'1	1371	46	3'3	4'31	3'1
	b 1357	48	3'5	1289	29	2'2	2'92	
	c 1337	36	2'7	1094	20	1'8	2'28	
Henstead	a 1314	58	4'4	1225	37	3'0	3'76	3'0
	b 1253	44	3'5	1104	37	3'3	3'43	
	c 1456	29	2'0	1224	21	1'7	1'86	
Loddon... ..	a 1663	81	4'8	1554	50	3'2	4'09	3'3
	b 1581	65	4'1	1412	33	2'3	3'28	
	c 1587	46	2'8	1347	33	2'4	2'68	
Depwade	a 2903	146	5'0	2562	73	2'8	4'00	3'2
	b 2683	97	3'6	2392	72	3'0	3'33	
	c 2768	64	2'3	2333	61	2'6	2'45	
Guiltecross	a 1318	64	4'8	1186	33	2'7	3'88	3'4
	b 1243	65	5'2	1112	27	2'4	3'91	
	c 1235	34	2'7	1054	24	2'2	2'52	
Wayland	a 1336	59	4'4	1294	37	2'8	3'68	3'3
	b 1256	55	4'3	1148	31	2'7	3'59	
	c 1288	37	2'9	1083	29	2'7	2'77	
Mitford... ..	a 3297	185	5'6	3086	87	2'8	4'30	3'4
	b 3204	125	3'8	2819	96	3'4	3'66	
	c 3330	89	2'7	2721	56	2'0	2'31	
Walsingham	a 2469	128	5'1	2229	85	3'8	4'54	3'3
	b 2325	75	3'3	2053	62	3'0	3'13	
	c 2409	67	2'8	2062	41	2'0	2'40	
Docking	a 2141	92	4'4	1950	48	2'4	3'43	2'0
	b 2042	69	3'3	1879	41	2'1	2'81	
	c 2034	56	2'7	1824	39	2'1	2'46	
Freebridge Lyon	a 1672	65	3'8	1439	50	3'4	3'68	2'0
	b 1571	49	3'1	1326	39	2'9	2'98	
	c 1567	38	2'4	1313	26	1'9	2'25	
Downham	a 2405	91	3'7	2216	64	2'8	3'36	2'7
	b 2316	70	3'0	2032	42	2'0	2'57	
	c 2267	60	2'6	1939	47	2'4	2'53	
Swaffham	a 1650	65	3'9	1460	46	3'1	3'57	2'8
	b 1571	44	2'8	1326	27	2'0	2'42	
	c 1474	44	2'9	1289	33	2'5	2'70	
Thetford	a 2306	118	5'1	2018	73	3'6	4'41	3'5
	b 2165	97	4'4	1874	60	3'2	3'88	
	c 2101	52	2'4	1811	45	2'4	2'47	

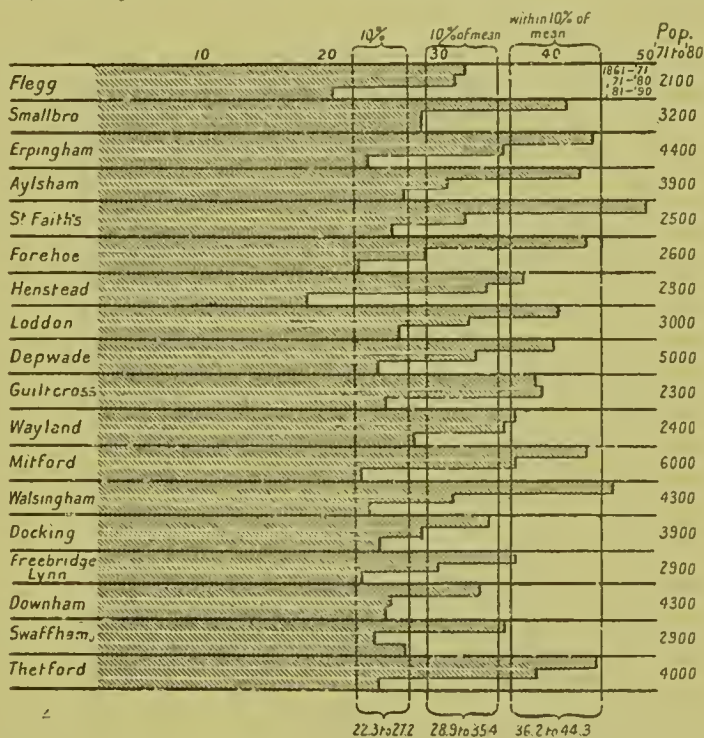
a, 1861-70.

b, 1871-80.

c, 1881-90.

CHART 7.

Phthisis Death rate per 10,000 living, aged 25-45, Norfolk Rural Sanitary Districts, showing similar rates in each decade for three decades, 1861-70, 1871-80, 1881-90.



The rate 36.2 to 44.3 is marked off to illustrate how these districts in 1861-70 very generally had a rate within 10 per cent. of 40.2, the mean of the whole area. Similar markings tell of like coincidences for the lower rate of 1871-80, and again for that still lower of 1881-90.

XXXII. DIAGRAMS ILLUSTRATING THE FLUCTUATIONS IN
THE DEATH-RATE FROM PULMONARY TUBERCULOSIS IN
ENGLAND AND WALES DURING THE LAST FIFTY YEARS.

By Dr. TATHAM,

Of the General Register Office, Somerset House.

XXXIII. THE GEOGRAPHICAL DISTRIBUTION OF PHTHISIS,
IN ENGLAND AND WALES, 1851—1860.

By Dr. ALFRED HAVILAND.

1. A large coloured MS. map of the geographical distribution of phthisis among *males*, throughout England and Wales, 1851—60.
 2. A large coloured engraved map of the geographical distribution of phthisis among *females*, throughout England and Wales, 1851—60.
 3. Two volumes of descriptive letter-press.
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XXXIV. DIAGRAMS.

By Dr. JAMES R. KAYE,

County Medical Officer, West Riding of Yorkshire.

A series of diagrams showing the history and behaviour of the death-rate from pulmonary tuberculosis in the West Riding.

XXXV. MAPS AND CHARTS EXHIBITED BY THE BATH
URBAN SANITARY AUTHORITY.

By W. H. SYMONS, M.D.

MAP 1.—Showing the distribution of deaths from all causes, and therefore approximately the distribution of the population, in central Bath during the five years 1896—1900; a proportion of 4179 deaths in the City of Bath.

MAP 2.—Showing the distribution of deaths from all forms of tuberculosis in central Bath during thirty-two and a half years, 1866-98, being a proportion of 3529 such deaths in the whole city. As compared with deaths from all causes a greater proportion of deaths from tuberculosis occurred in the central parishes.

MAP 3.—Showing the deaths from all forms of tuberculosis in one locality for each of three decades—1866-75, 1876-85, and 1891-1900. Between the years 1886 and 1900 two insanitary courts and adjacent cottages were demolished by the land-owner, and replaced by modern tenement house; these have been fully occupied since 1891, but the number of deaths from tuberculosis have been very few compared with those of previous decade.

MAP 4.—Showing the death-rates from tuberculosis in the various registration districts of Somerset during the ten years 1881-90.

MAP 5.—Geological maps of Bath. Six inches to the mile.

CHART A.—Columns indicating the number of deaths from various causes in England and Wales, and in Bath. Comparing the six commonest causes of death with deaths from the six most dreaded infectious diseases.

CHART B.—Death-rates from all causes, England and Wales, and Bath, 1866-1900.

CHART C.—Death-rates from phthisis and other forms of tuberculosis among persons of both sex, England and Wales, and Bath, 1876-1900.

CHART D.—Death-rates from phthisis and other forms of tuberculosis among males and females considered separately, England and Wales, and Bath, 1876-1900.

XXXVI. MAPS, CHARTS, AND DIAGRAMS ILLUSTRATING THE GEOGRAPHICAL DISTRIBUTION AND PREVALENCE OF, AND MORTALITY FROM, TUBERCULOSIS.

FROM THE EDINBURGH PUBLIC HEALTH COMMITTEE'S REPORT ON THE PREVENTION OF CONSUMPTION.

1. Map showing the geographical distribution of phthisis.
2. Map showing degrees of prevalence of tuberculosis in various European states.
3. Map showing the degrees of prevalence of inflammatory diseases of the breathing organs, exclusive of consumption, in various European states.

4. Chart showing relative prevalence of tuberculosis in some principal capitals of the world at close of the nineteenth century.
5. Map showing degrees of prevalence of tuberculosis in Great Britain and Ireland, 1894-97.
6. Chart showing number of deaths from several causes occurring in England and Wales during the five years, 1891-95.
7. Chart showing analysis of mortality in Edinburgh from all causes during ten years, 1893-99 inclusive.
8. Chart showing death-rates from phthisis in England and Wales per 10,000 living, 1838-94.
9. Comparative table of mortality from phthisis in Glasgow per 1,000,000 inhabitants in quinquennial periods for 45 years, 1855-99 inclusive.
10. Comparative table of mortality from phthisis in Glasgow per 1,000,000 inhabitants in quinquennial periods for 45 years, 1855-99 inclusive.

XXXVII. DIAGRAMS AND CHARTS EXHIBITED BY THE PRUDENTIAL INSURANCE COMPANY OF AMERICA.

By FREDERICK L. HOFFMAN.

A. *Tuberculosis in the United States.*

1. Mortality from tuberculosis in the United States (registration area) 1871-1900.
2. Mortality from tuberculosis in the United States by sex, 1871-1900.
3. Mortality from tuberculosis in American cities by race, 1871-1900.
4. Mortality from tuberculosis in the United States (registration area) by age periods, 1871-1900.

B. *The Mortality Experience of the Prudential Insurance Company of America.*

5. Mortality from principal causes, 1891-1899.
6. Mortality from tuberculosis by age and sex, 1891-1899.
7. Mortality from tuberculosis by age and race, 1891-1899.

8. Mortality from tuberculosis by age and nativities, 1898-1899.
9. Mortality from tuberculosis by thirty occupations, 1897-1899.
10. Mortality from tuberculosis by occupation and age, 1897-1899.
11. Mortality from tuberculosis and eight other diseases by duration of insurance according to sex, 1891-1899.
12. Mortality from tuberculosis by duration of insurance, medically examined and not examined risks according to sex, 1891-1899.

C. Experience with Rejected Risks.

13. Rejections for tuberculosis, respiratory diseases, and family history, 1888-1898.
14. Termination of risks rejected for tuberculosis, family history, and all causes, 1888-1898.
15. Mortality from tuberculosis of risks rejected for tuberculosis, family history, and all causes, 1888-1898.

D. The Physical Condition of Decadents from Tuberculosis.

16. Physical condition of applicants at entry ; relation of disease to stature and weight ; industrial experience, 1886-1893.
17. Physical condition of applicants at entry ; the relation of disease to stature, weight, and chest expansion, ordinary experience, 1886-1899.

E. The Financial Aspects of the Problem.

18. Average and actual loss ; deaths from tuberculosis, 1895-1898, with distinction of age.
 19. Average and actual loss ; deaths from tuberculosis, 1895-1898 ; medically examined and not examined risks.
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XXXVIII. EXHIBITS RECEIVED FROM THE GERMAN CENTRAL COMMITTEE FOR THE ERECTION OF SANATORIA FOR THE TREATMENT OF LUNG DISEASES, FROM THE GERMAN IMPERIAL BOARD OF HEALTH, AND FROM THE GERMAN GOVERNMENT INSURANCE OFFICE.

The collection contains :

1. Charts and diagrams dealing with the distribution of consumption, and its relation to other diseases.
2. Plans and photographs of the German sanatoria.
3. A general map of Germany giving all the public and private sanatoria for consumptives at present erected, as well as those in course of construction, including dispensaries. (See Special Catalogue.)

XXXIX. TUBERCULOSIS IN NORWAY.

I. FROM THE DIRECTOR OF CIVIL MEDICAL AFFAIRS IN NORWAY.

Dr. HOLMBOË.

1. A coloured map representing the mortality from pulmonary tuberculosis during the quinquennium 1867-71.
2. A similar map representing the quinquennium 1893-7.
3. Schematic representation of the same from 1867-97.

II. FROM THE DIRECTOR OF CIVIL VETERINARY AFFAIRS IN NORWAY.

Dr. MALM.

1. A coloured map representing bovine tuberculosis in Norway, as shown by the tuberculin examination, during the years 1897-9 in the parishes.
2. A coloured map representing bovine tuberculosis in Norway, as shown by the tuberculin examination, during the years 1895-9 in the counties.
3. Schematic representation of bovine tuberculosis as shown by the tuberculin examination during the quinquennium 1895-9.
4. Distribution of bovine tuberculosis in Norway in the parishes and counties according to the public examinations with tuberculin in 1895-7.

DIAGNOSIS—THERAPY—PROPHYLAXIS OF TUBERCULOSIS.

XL. REPORTS OF THE ROYAL COMMISSIONS ON TUBERCULOSIS.

1. 1888. Report of the Departmental Committee appointed to inquire into Pleuro-pneumonia and Tuberculosis in the United Kingdom.
2. 1895. Report of the Royal Commission appointed to inquire into The Effect of Food derived from Tuberculous Animals on Human Health.
3. 1898. Report of the Royal Commission appointed to inquire into The Administrative Procedures for Controlling Danger to Man through the Use as Food of the Meat and Milk of Tuberculous Animals.

XLI. TUBERCULIN.

INTRODUCTION TO THE EXHIBITS OF THE FARBWERKE VORM MEISTER LUCIUS AND BRÜNING.

The old Tuberculinum Kochii exists since 1892. The new article has been prepared by the Farbwerke on a large scale since 1897 in a building specially constructed for the purpose. A model of this building is exhibited. The internal arrangements are shown in the accompanying photographs. They show the entrance hall, the cleansing room, the laboratory, the hall for disinfecting apparatus, the machine room, the ball mills, the apparatus for evaporation, and the stalls for the animals.

For the preparation of the "old Tuberculin," cultivations of tubercle bacilli were grown in incubators in a solution of extract of meat, peptone, and sodium-chloride, with addition of glycerine. When the cultures cover the solution with a thick layer and become moist and sink, the cultivating medium is evaporated to one tenth of its volume, filtered and preserved by addition of 0.5 per cent. carbolic acid. The "old Tuberculin" is before distribution tested under Government control at the Hospital for Experimental Therapy in Frankfort. In order to obtain a preparation as uniform as possible, a minimum quantity of 100 litres is submitted to testing at one time.

For the preparation of "new Tuberculin" highly virulent cultures grown upon a specially prepared nutrient medium are selected. Only young cultures are used. They are well dried in a vacuum exsiccator, and then pulverised in ball-mills so finely that no colourable tubercle bacilli remain; the powdered product is then suspended in distilled water in the proportion of 1 to 100, and centrifugated. With the aid of very powerful centrifugators the liquid can be separated into an upper transparent layer (T.O.) and a solid adherent muddy

precipitate (T.R.). The latter is again dried, powdered, suspended in water, and centrifugated as before. The supernatant liquid obtained by this second centrifugation is the "new Tuberculin." It is only delivered freshly prepared after its contents in solid substance has been estimated and its activity tested upon tuberculous guinea-pigs.

There are also exhibited a collection of tubercle bacilli cultivations which have yielded the "old Tuberculin"; likewise pulverised cultivations from which "new Tuberculin" is prepared.

XLII. By PROFESSOR ED. NOCARD,

Ecole d'Alfort.

A trocar-harpon for the diagnosis of tuberculous mastitis and adenitis.

OPEN-AIR TREATMENT.

XLIII. PHOTOGRAPHS ILLUSTRATING THE METHODS OF CONDUCTING THE OPEN-AIR TREATMENT.

EXHIBITED BY DR. W. P. MEARS, and DR. J. J. GALBRAITH.

Woodburn Sanatorium, Edinburgh.

1. Photograph of Woodburn Mansion House, adapted for Sanatorium treatment (from S.E.).
2. Photograph of Woodburn House, showing patients sitting out on an ash-covered terrace (from S.)
3. Photograph of patient, æt. 16, shortly after admission.
4. Photograph of same patient (3) after a year of Sanatorium treatment; net gain 63 lbs.
5. Photograph of patient taken in Canary Islands shortly before admission.
6. Photograph of patient (5) after a year of Sanatorium treatment; net gain in weight 21 lbs.
7. Photograph of patient æt. 20, shortly before admission.
8. Photograph of same patient (7) a year later, after six months' treatment; net gain in weight 14 lbs.
9. Photograph of patient before admission, æt. 16.
10. Photograph of same patient (9) after a year's treatment; net gain 41 lbs.
11. Photograph of patient æt. 26, shortly after admission.
12. Photograph of same (11) after 9 months' treatment; net gain in weight 60 lbs.
13. Ordinary room as used for open-air treatment. No carpets, curtains, or hangings. Washable furniture.

14. Pavilion room specially designed for open-air treatment, showing large window space, 5 by 8 feet. Windows opening outwards, one fourteenth of total wall area. Furniture as in 13.
15. Photograph of patient in bed outside under shelter (for bad cases).
16. Photograph of pavilion (see Plan in Architectural section).
17. Photograph of dining tent; no walls are used.
18. Photograph of patients at dinner in tent.

XLIV. CHARTS ILLUSTRATING EFFECT OF OPEN-AIR TREATMENT.

Exhibited by DR. W. P. MEARS, and DR. J. J. GALBRAITH.

Set of six charts illustrating the effect of the open-air treatment on the daily temperature in pulmonary tuberculosis, and the relations between the Temperature curve (black), Weight curve (green), and Pulse curve (red). Treated at Woodburn Sanatorium, Edinburgh.

CASE 1.—J. T., æt. 16. Duration some months. Both apices involved, considerable cavity formation. Complication :—Phthisis laryngea. Weight (green curve) 9 st. 12 lbs. on admission; a year afterwards 12 st. 11 lbs. Temperature curve (black) shows influenzal attacks preceded or accompanied by loss of weight and followed by the establishment of a lower mean level and a rapid increase in weight (see case of photographs).

CASE 2.—G. F., æt. 16. Duration several months. Extent of involvement :—both lungs, lower lobe alone clear, large vomicae. Complications :—digestive disorder marked; frequent recurrent hæmorrhages (see vertical red lines). Extreme emaciation 7 st. 1 lb. to 11 st. 8 lbs. Great changes in general appearance and development (see photographs).

CASE 3.—W. S., æt. 26. Duration two to three months. Considerable temperature swing on admission. Complicated by throat and nose troubles. Weight 9 st. 12 lbs. to 11 st. 1 lb., level subnormal temperature on discharge.

CASE 4.—J. G., æt. 22. Duration three months; involvement of upper lobe of both lungs with cavity formation. No complications. Marked improvement immediately on admission in temperature and pulse (red) curves, with rapid and steady gain in weight (green curve). Present weight at work 13 st. 10 lbs.; net gain 46 lbs.

CASE 5.—M. E., female, æt. 21. Widespread congestion, consolidation, and cavities all over both lungs except at the extreme base. Complications :—Phthisis laryngea; septic absorption from teeth. Slow but steady gain in weight, and establishment of subnormal temperature which is still maintained at home.

CASE 6.—A. G., æt. 19. Vomicae at both apices. Inverted temperature, subnormal, with considerable swing. Chart shows gradual diminution of swing, and steady increase in weight.

XLV. SANATORIUM FITTINGS.

Exhibited by S. MAW, SON, and SONS, London.

1. Couch of wicker work, and covering for use in open-air pavilion or verandah.
2. Table with glass top for bedside use.
3. Spittoons, various : (a) Bedside. (b) Ward. (c) Pocket.
4. Sanitary handkerchiefs.
5. Ward thermometer, porcelain.

XLVI. APPARATUS FOR PNEUMATIC MASSAGE.

By Dr. CH. BREUILLARD,

Of Saint-Honoré-les-Bains, Nièvre, France.

Dr. Breuillard's apparatus for pneumatic massage consists mainly of a hollow block of indiarubber called the "rubbing ampulla," which can be taken in the hand as a brush. In the hollow cavity of this soft flexible ampulla is a tube also of indiarubber, long or short as required, and fastened to the hollow apparatus.

This new vacuum apparatus consists of a water ejector fixed on to a pedestal reservoir containing about a litre of water, and furnished with a small double pump, exhaustive and forcing ; the water, forced up by means of pedals, passes slowly through the tube and returns to the pedestal reservoir, from whence it again returns. It is impossible for the mechanism to get out of order.

Immediately the apparatus is set in motion by the feet of the operator the vacuum is produced in the ampulla, and if the latter is applied to any part of the body whatever the skin is simultaneously grasped and squeezed in the cavity.

Therefore in moving this ampulla over the body a friction of the skin is produced, the weight of which varies from 10 to 20 kilos. according to the vacuum produced, and a redness more or less vivid becomes apparent. The vacuum may vary from 30 to 60 cm. of mercury ; if the skin is taken at the nape of the neck, for instance, it can be rubbed and worked up without being loosened down to the heel.

Dr. Breuillard will describe in his communication to the Congress the novel and exceptional physiological and therapeutic action of this new method of stimulating the skin, which, according to his idea, may advantageously take the place of manual massage, hydrotherapy, and various electrical methods.

XLVII. AN AUTOMATIC AND HYDRAULIC SPITTOON.

By Dr. E. RIBARD (Paris).

XLVIII. MICRO-PHOTOGRAPHS TO SHOW THE ORGANISMS OF CONSUMPTION IN DIFFERENT SUBSTANCES.

FROM THE EDINBURGH PUBLIC HEALTH COMMITTEE'S REPORT ON THE PREVENTION OF CONSUMPTION.

1. Specimen of tubercle bacilli in milk ($\times 1000$).
2. Tubercle bacilli in sputum ($\times 1000$), from case of ordinary pulmonary phthisis.
3. Tubercle bacilli lying in the tissue of a tuberculous gland ($\times 2000$).
4. Tubercle bacilli lying inside a phagocyte or white blood-corpuscle ($\times 1000$).

NOTE.—Preparations showing the tubercle bacilli in different substances will be found in the Microscopic Collection.

VENTILATION.

XLIX. A WORKING MODEL ILLUSTRATING THE EXHIBITOR'S METHOD OF VENTILATION.

Exhibited by THOS. GLOVER LYON, M.D.

Air Supply.—Two centrifugal fans of the Sturtevant type are fitted upon a common axle. Disc fans of efficient models will usually serve, the resistance at the screens being very slight. The restaurant of the Queen's Hall is ventilated during the Congress by this method.

Inlets.—Air is forced along a conduit, and issues from one side of it through a tapering longitudinal slot broadest at the inlet end, fitted with baffle plates (c, Fig. 1 and Fig. 2). The air is then let into the room through perforated screens (Figs. 1 and 4) of variable closeness (Figs. 1 and 4 right-hand side). The air issues evenly all along the slot because it heaps up towards the closed end, and so the greatest pressure of air inside the conduit corresponds to the narrowest part of the slot. Fig 3. shows the mode in which air issues from a conduit through a slot of uniform width unprovided with baffle plates. On the same principle the perforated screens have their largest meshes nearest the conduit. By these means air is caused to issue nearly evenly from all parts of the screen.

FIG. 1.

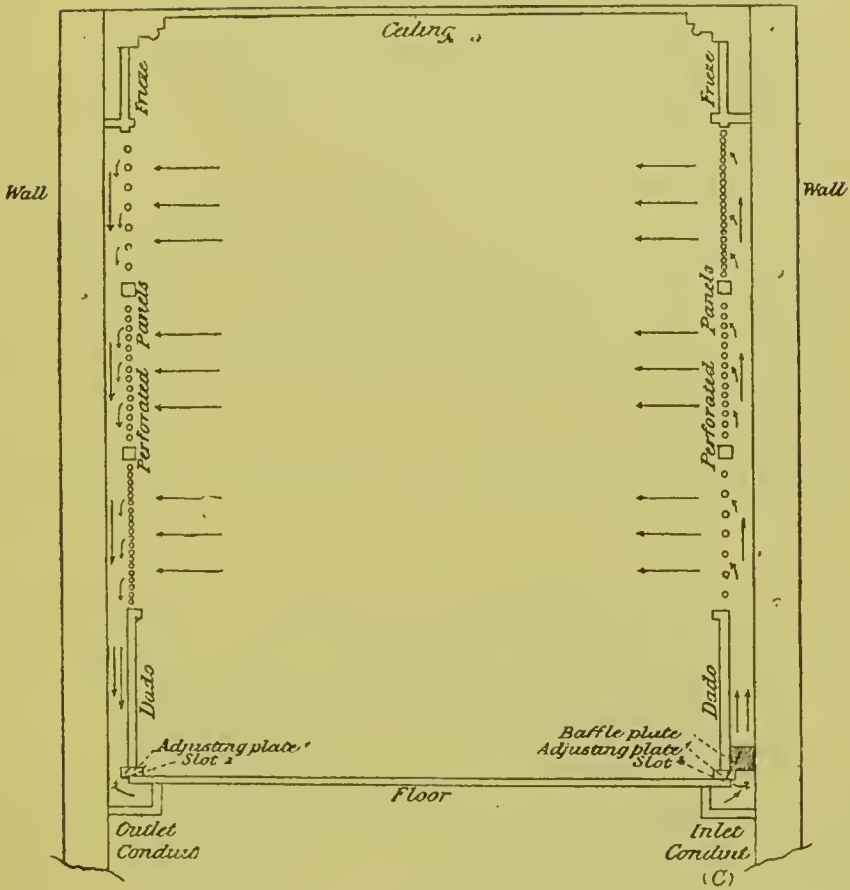


FIG. 2.

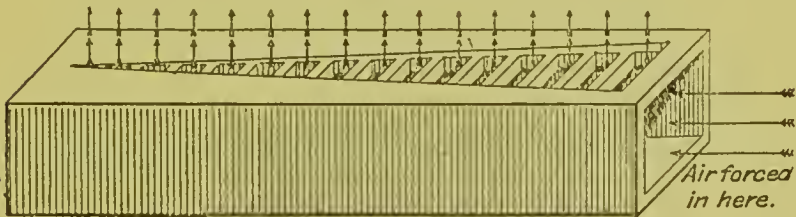
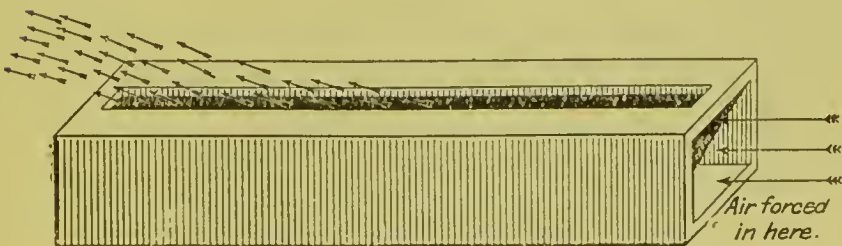


FIG. 3.



A stream of air running along a conduit is converted into a volume of air flowing at a greatly reduced speed into a room.

Outlets.—The foul air is passed through extensive outlets in a similar manner into a conduit and conveyed away. The outlet slot is narrowest at the end from which the air passes away. The screens are openest at the part furthest from the conduit, and no baffle plates are necessary (Fig. 1, left-hand side).

The plenum or vacuum systems of air propulsion may be used, or, preferably, a combination of both. By employing blowers to force in the air, and exhausts to draw it off, control of inlet and outlet is maintained without closing windows or doors, and open fireplaces can be used. The air on admission may be treated in any way desired. (Fig. 4 shows ventilating screens on either side of a window; they may be placed upon blank walls.)

Example.—The capacity of a room 50 feet long, 30 feet broad, and 20 feet high, is 30,000 cubic feet, or 300 cubic feet per head for 100 persons.

FIG. 4.



If we change the air in such a room once in six minutes, we supply 3,000 cubic feet to each person. Supposing we make the inlets and outlets in opposite side-walls of the room equal in area to a quarter these walls, that is, 250 feet in area, and pass air through the inlets and outlets at four inches a second, the air in the room will be changed every six minutes, and draughtless ventilation is effected with only 300 cubic feet of air space per head.

The diagrams are arranged to illustrate the principles of the method in the simplest possible manner. The panels may be rendered decorative.

APPARATUS FOR RENDERING MILK INNOCUOUS.

L. SKETCH OF A SMALL BOILER—AN APPARATUS FOR STEAMING MILK CANS, ETC.

By W. H. SYMONS, M.D.,

Medical Officer of Health, Bath.

LI. A MILK SAUCEPAN FOR STERILISING MILK.

MAW, SON AND SONS, LONDON.

LII. THE SENTINEL MILK STERILISER (PATENT).

By THE SENTINEL COMPANY, LIMITED, CAMBRIDGE.

In the sterilisation of milk by methods suitable for general use two things are desirable. Firstly the milk must be heated to a temperature high enough to destroy the pathogenic bacilli; secondly, the heating should be stopped at this point, for the higher the temperature reached the more the taste, digestibility, and nutritive properties of the milk are impaired.

The Sentinel Milk Steriliser insures both these objects. The milk is heated in a vessel (which is surrounded by a water-jacket in the larger sizes), and at a temperature of 85° C. (185° F.) the heating is stopped. In one form the milk is heated over a gas or spirit flame, and at 85° the flame is automatically extinguished. Another form is adapted for use on a fire, and rings a bell when the same temperature is reached.

The action of the steriliser depends on the melting of an alloy, a small quantity of which is contained in a tube immersed in the milk. The alloy fuses at 85°, and then liberates a spring or weight which extinguishes the flame or rings the bell. Thus it is as impossible for the temperature to exceed as to fall short of the safety limit. The apparatus is ready to be reset as soon as the alloy cools, and can thus be used continuously.

The sterilisers are made in all sizes from one pint to twenty-four gallons.

LIII. LISTER'S FILTERING AND PASTEURISING PLANT.

From R. A. LISTER AND COMPANY, LIMITED, DURSLEY.

This plant is designed to supply a thorough and practical means of cleansing, pasteurising, and rendering the milk innocuous, and without in any way affecting the taste of it. This is accomplished in the following way, viz.—The milk brought from the farms is poured into a receiver on the floor, into which it passes through a finely meshed wire strainer, and is then pumped from this receiver into a large receiver overhead. From there it passes through a filter, and then to a pasteuriser, where it is heated to 150° F., and is kept in motion by the agitators inside the pasteuriser, these agitators being driven by the steam which heats the milk. From the pasteuriser it flows into a retaining tank, where the continual flow of the incoming milk and the peculiar way the inside is made keeps the milk in circulation the whole of the time it is inside. When this gets full the milk automatically flows over a cooler. The tank is designed so as to take twenty minutes to fill, and it is made so that the whole of the milk must remain inside for twenty minutes. After passing over the cooler, where the milk is cooled down instantly within 2° of the temperature of water, it flows into a railway churn or other receptacle, and is ready for disposal. This plant is made in any size to deal with any quantity of milk per hour from 50 gallons to 1350, and is designed so that all parts coming in contact with the milk is in full sight, and can be easily and thoroughly cleansed. A lime-water tank is supplied with the plant, and is arranged so that cold and hot lime water can be run through the plant in the same manner as the milk, and the cleansing is almost automatic.

BRITISH CONGRESS ON TUBERCULOSIS.

ARCHITECTURAL SECTION OF MUSEUM.

Collected and arranged by

THOMAS W. CUTLER, F.R.I.B.A., F.SAN.I., ETC.

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SANATORIA AND HOSPITALS.

I. SANATORIUM OF HALAHUET, PROVINCE OF NÉRICIE, SWEDEN.

Exhibited by THE COMMISSION OF THE SANATORIA OF SWEDEN,
Mr. DE PRINTRSKOLD, President.

1. Picture shows site of the sanatorium.
2. Photograph of the principal façade of the sanatorium.
3. Photographs of the interior of the sanatorium.
4. Plans of the sanatorium.

SANATORIUM OF OSTERASON, PROVINCE OF VESTERNORRLAND, SWEDEN.

5. Photograph of the principal façade of the sanatorium.
6. Photographs of the interior of the sanatorium.
7. Plans of the sanatorium.

II. THE WEHRAWALD SANATORIUM IN THE BLACK FOREST OF SOUTHERN BAVARIA.

By Dr. LIPS.

The Wehrawald Sanatorium recently erected in a quiet retreat, 861 metres above sea level, is intended for the reception of consumptives, prophylactics, and patients afflicted with chronic lung diseases, pleurisy, chronic bronchitis, and asthma. Built on a southern spur of a lofty and thickly-wooded range of hills, and looking over the Wehrathal, it is surrounded by a magnificent wood of fir trees which affords ample protection against wind and weather. It is quite open to the south and south-east, and the climate combines all the advantages of a forest and mountain retreat.

The sanatorium consists of the main building, the physician's residence in close proximity thereto, and the administrative offices and engine-house down in the valley.

The main building is in three parts: (*a*) the central one of five stories containing the patients' rooms; (*b*) the one-storied medical wing with the hydrotherapeutic and medical treatment rooms; and (*c*) the one-storied domestic wing with offices, refectory, and kitchen. In this way the principle—so highly

important in a home for consumptives—of the separation of all subsidiary rooms has been strictly carried out.

In front of the central building is the spacious resting pavilion, 80 metres long, the side wings of which run out at an angle to the south. Below the resting pavilion is the promenade of the same length. In the grounds in front two more resting pavilions have been erected. On the ground floor of the central building and looking towards the south are the beautifully furnished assembly rooms, concert hall, drawing room, library, reading room, and the two extensive luggage rooms for ladies and gentlemen, in which a separate compartment is always at the disposal of any guest. The physician's house contains the private residence of the doctors in attendance, and fourteen rooms for patients. All the upper floors consist exclusively of the patients' bedrooms. The sanatorium contains ninety-eight rooms, of which *not a single one* faces the north.

The establishment has its own supply of spring water (with pressure of ten atmospheres); sewerage system with disinfecting apparatus, low-pressure heating and electric lighting. The principle of cleanliness and disinfection is strictly enforced not only in the building itself, but in all things, down to the smallest utensil. The corners in all rooms are rounded off, and the walls are hung half way up with washable hygienic wallpaper. The floors are covered with linoleum. Electric bells and telephone all over the house. Hydraulic passenger lift in the principal building. The establishment is open all the year round.

The plans were carried out, on the lines laid down by Mr. Courtcouncillor Turban, of Davos, by Mr. Gros, architect of Zurich. The curative treatment is based on the method devised by Bochner and Dettweiler, and improved by Turban, and is consequently strictly individualistic. The head physician is Dr. Lips, formerly assistant physician at Dr. Turban's sanatorium, Davos. The Wehrathal, in which the Wehrawald rises like a castle, forms from its wild romantic character one of the loveliest of the much-praised valleys of the Black Forest.

III. SANATORIUM ALLAND, NEAR VIENNA, AUSTRIA.

By Professor SCHROTTER.

The water-colour drawing shows the position of the different buildings of the great sanatorium for consumptives at Alland, near Vienna.

The pavilion for 108 patients faces south, and is protected on the north by wooded hills.

At some distance are the farm buildings for forty cows, six oxen, horses, pigs, etc.

Adjoining this is the laundry, engine-house for electricity, chemical, bacteriological, and histological laboratories.

At the left corner is the house of the director, with rooms for the official work of the establishment.

IV. SCHATZALP SANATORIUM, ABOVE DAVOS, SWITZERLAND.

By Dr. E. C. NEUMANN.

Plans and details of the sanatorium.

V. THE PUBLIC SANATORIUM FOR CONSUMPTIVES AT HELLEN-DOORN (PROVINCE OF OVERYSEL, HOLLAND).

By Dr. R. DE JOSSELIN DE TONG.

This sanatorium is situated on the crest of a hill, and is surrounded by thick pine woods. It is built in the form of a slightly bent half-moon, facing the south, and consists of a principal building, to accommodate fifty-four patients, and a separate building for the domestic departments, consisting of a machine room, laundries, and kitchens. Entirely apart from this latter is a special kitchen for Jewish patients. Houses for the medical director, the manager, engineers, and coachman are at some distance, and still further removed is a house where possible acute infectious diseases can be isolated.

The whole south front of the principal building consists of bedrooms, five to contain six beds, and six for four beds. On the north is a long corridor with the closets. At each end are the resting halls, at one end for the men, at the other for the women. In addition the building contains two dining-halls, two sitting-rooms, and two reading-rooms. The nurses all sleep in this building.

The sanatorium is heated by steam, has electric light, and good water works. The water, which is excellent, is procured on the spot by boring. The excreta are carried with the drain-water to a biological filter and thoroughly disinfected. The sputa are disinfected in ovens. The washing is done in a steam steriliser. The soil is sand.

There are small gardens immediately surrounding the principal building, but otherwise it is closely sheltered on the north and east by a range of hills covered with pine woods, and on the west by an extensive pine forest.

ORANJE-NASSAU-OORD (PROVINCE OF GELDERLAND).

FOUNDED BY

HER MAJESTY THE QUEEN-MOTHER OF HOLLAND.

The sanatorium is situated on the Estate Oranjé-Nassau-Oord, in the township of Wageningen; is sheltered on the west by a wooded hill on the south-

west by the Wageningen hills, and for protection from the east winds a mound has been raised and covered with trees.

The building is built in a half-circle facing the south-south-west, and is arranged to contain 100 patients. It is divided into—(1) east wing, with the existing villa or palace; (2) department for the treatment of the patients; (3) middle building or pavilion which faces the south; (4) west wing with resting halls.

The east wing, which is built on the existent villa, contains a small dining-hall for the patients, a butler's pantry, and the connecting corridor to the department where the patients are treated. In the basement is a dining-hall for the employees, under that used by the patients. The existent villa (formerly the palace of her Majesty the Queen) contains, besides the rooms for the employees, eleven bedrooms for two beds, eight for one bed, with the necessary rooms for the nurses, bath-rooms, and closets.

Through the connecting corridor the department where the patients are treated is reached. This is divided into a vestibule, consultation-room for the medical director, a room for the assistant-physician, dressing-room, bath-rooms, inhalatorium, and closets, while the basement is arranged for a laboratorium. The middle building or pavilion has two stories. The first contains a large general sitting-room, with verandah on the front. A boot-room near the entrance, three bedrooms for four beds and one for six. At the back is a large dining-room, with pantry rooms for the nurses, lavatories, storerooms, and stairs. All the apartments open on to a large corridor, 3 yards wide, running from end to end at the back.

The upper story contains in the front six bedrooms for four, and five bedrooms for six beds, besides bath-rooms, rooms for the nurses, storerooms, and water-closets at the back. The rooms all open on to the long corridor at the back.

The west wing consists of resting halls. Besides the principal building there are: (1) a house for the medical director, situated about 30 yards further to the south than the west wing, and fitted with every modern improvement; (2) the domestic department is at about 60 yards to the east of the sanatorium. This building contains kitchen and scullery, laundries, drying-rooms, disinfecting rooms, and the offices. The food is brought from the kitchen to the pantries by means of electric cable cars.

All the buildings are lighted by electricity, and are central heated. The necessary electric current is procured by a dynamo, driven by a vertical compound engine. The machinery and dynamo, with the three necessary boilers for the heating apparatus, are all in the machine-house. The heating is done by radiators. Hot and cold water is laid on for all the bath-rooms, the douche baths, kitchens, and pantries. The refuse and excreta is drained to a filter, where it is disinfected. Electric bells and telephonic communication are laid on in most of the rooms.

VI. GERMAN CURE ESTABLISHMENT IN DAVOS.

STATION WOLFGANG ON THE RHATISCHEN RAILWAY, CANTON GRANDBUNDER,
SWITZERLAND.

Designed by HERR C. WETZEL, Architect, Davos.

The Cure Establishment offers bed accommodation to 80 patients; it is three-storied, and is divided into a gentlemen's wing, a ladies' wing, a central building with dining room and household offices. The gentlemen's wing as well as the ladies' contain beside the ground floor two upper stories, each with beds for 20 patients, arranged into 8 one-bedded, 2 two-bedded, and 2 four-bedded rooms; a one-bedded room has 45 cubic metres air space; a two-bedded one, 35 cubic metres; and a four-bedded one, 30 cubic metres per bed.

The wings contain on the ground floor, besides the servants' offices, large cloak rooms, which enable the patients to go out of doors at once without returning to their rooms.

In the middle building—in the cellars underneath—are the heating apparatus and kitchen; on the ground floor shower and ordinary baths; on the first floor the doctor's rooms and the reception rooms; and on the top floor the living apartments of the senior doctor.

For every 2 four-bedded patients' rooms there is arranged a lavatory on each floor.

The rooms with a greater number of patients' beds were designed in order to be able to give the benefit of the treatment to a greater number of patients of less means at a smaller cost for building.

The size and arrangement of the single rooms is carried out on the most complete scale.

The design for the building was decided upon after a very careful study of a great number of existing health establishments, sanatoria, and hospitals; the committee chose for the carrying out of the building the firm of C. Wetzel, in Davos Platz, as architect and builder; the health establishment will be given over to the managing committee in the autumn of 1901.

VII. SANATORIUM AND OTHER BUILDINGS, LISBON,
PORTUGAL.

By Professor D. A. DE LENCASTRE,

UNDER THE PRESIDENCY OF

HER MAJESTY THE QUEEN OF PORTUGAL.

1. Plan of sanatorium now in course of construction for 128 scrofulous children.

The inauguration of one of the pavilions will take place in October.

2. Plan of one of the dispensaries.
3. Plan of the central institution for tuberculosis at Lisbon for the study and treatment of tuberculosis, now in course of construction.

VIII. PLANS AND PHOTOGRAPHS OF THE SANATORIA, ETC. OF FRANCE.

By Professor L. LANDOUZY, Paris.

1. Map of France, showing holiday resorts, agricultural settlements, marine hospitals, public dispensaries, and public sanatoria.

Plans and photographs of the following sanatoria :

Agincourt.	Hauteville.
Arcachon.	Lorraine.
Argeles.	Ormenon.
Bligny.	Villepinte, etc., etc.
Gien.	

2. Plans and photographs of the public dispensaries at Paris and Lille.

IX. DR. BREHMER'S CURE INSTITUTION, GÖRBERSDORF, GERMANY.

By Dr. BREHMER.

Photographs of the institution.

X. PLANS AND PHOTOGRAPHS OF SANATORIA OF DENMARK

By Professor C. GRAM, Copenhagen.

1. Vejle fjord Sanatorium, Daugaard.
2. Boserûp Sanatorium.
3. Kyst (sea-side) Hospital, Refsnäs.
4. Kyst (sea-side) Sanatorium, Juelsminde.
5. Hellebæk Sanatorium.

X A. SANATORIUM BEAUREGARD, PRES MONTANA (VALOIS), SWITZERLAND.

By Dr. T. STEPHANI.

Elevation and plans of the sanatorium.

X B. SANATORIUM DE MONT-S/-MEUSE, PROVINCE DE NAMUR, BELGIUM.

By Dr. HOTTLET.

1. Plan and façade.
2. Plan of site and grounds.

XI. SANATORIUM AT WINSLEY, WILTSHIRE.

By Dr. L. D. WEATHERLY, Bath.

Designed by Messrs. SILCOCK AND REAY, Architects, Bath.

Sketch of a sanatorium at Winsley, Wiltshire, for the Gloucester, Somerset, and Wilts Branch of the National Society for the Prevention of Consumption, together with photographs of the site and surroundings.

XII. SANATORIUM NEAR MANSFIELD, NOTTINGHAMSHIRE.

By Dr. W. B. RANSOM, Hon. Sec.

This sanatorium is situated two miles from Mansfield, on an estate of fifty acres of moorland and pine forest, given for the purpose by the Duke of Portland, and is being erected by the Portable Building Company, Manchester, according to the plans of the Nottinghamshire Association for the Prevention of Consumption, for the treatment of consumptives of limited means.

The walls are double, there being an air-space and a layer of felt between the outer and the inner.

The inner walls are of "compo boarding" coated with duresco and petrifying fluid.

There are two wards of six beds each for the two sexes, each with isolation ward and offices attached.

Each ward has a north and a south verandah. Meals will be taken in the wards. The administrative block is intended to accommodate a staff sufficient for a larger number of patients, who will live in huts, tents, or other pavilions.

Heating :—Low-pressure hot water, and radiators. Lighting :—Electric
Sewage :—Water carriage and "bacterial filtration."

XIII. MENDIP HILLS SANATORIUM,

HILL GROVE, OVER WELLS, SOMERSET.

By S. OWEN, Esq., Secretary.

Various views of the sanatorium.

XIV. LONDON OPEN-AIR SANATORIUM.

NINEMILE RIDE, WOKINGHAM.

London Address.—20, HANOVER SQUARE, W.

Designed by FRANCIS E. JONES, Architect, London.

Set of photographs and general plan.

XV. SANATORIUM FOR THE BROMPTON CONSUMPTION HOSPITAL.

Designed by Edwin T. HALL, F.R.I.B.A., F. San. Inst., London.

1. General view of the sanatorium at Frimley, Surrey, for 100 patients.
2. Plan of ground floor.

CAMBERWELL INFIRMARY.

1. General view.
2. Block plan.
3. Plan showing wards for tuberculosis.

XVI. THE NORTH LONDON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, MOUNT VERNON, HAMPSTEAD, N.W.

By Messrs. ROGER SMITH, and SON, Architects, London.

1. Ground and first-floor plans of the hospital as at present existing. Scale eight feet to an inch.
2. Plans of five floors of the hospital, showing a design for the proposed completion of the building. Scale sixteen feet to an inch.
3. South elevation and a part of the first-floor plan, showing a design for the proposed completion of the building. Scale ten feet to an inch.
4. Site plan.

XVII. EMPRESS VICTORIA WARD, ROYAL BOSCOMBE AND WEST HANTS HOSPITAL.

Designed by G. A. BLIGH LIVESAY, F.R.I.B.A., Bournemouth.

DESIGN FOR A PRIVATE SANATORIUM, SUITABLE FOR THE OPEN-AIR TREATMENT OF PHTHISIS.

By G. A. BLIGH LIVESAY, F.R.I.B.A., from suggestions by
A. RANSOME, Esq., M.D., F.R.S.

XVIII. WOODBURN SANATORIUM, EDINBURGH.

By Dr. J. J. GALBRAITH.

1. Ground plan and elevation of pavilion. Rooms are 10 ft. 6 in. by 14 ft. 6 in. by 11 ft. 9 in.; facing south and entered from a corridor behind. Windows are 5 ft. by 8 ft. and open outwards. Hoppers over door and windows. Heating by open fires burning smokeless fuel. Building raised on brick piers and built of wood. Walls contain two spaces filled respectively with air and non-conducting material, lined with wood, and covered with oak shingles. Wings contain bath-rooms, w.c.s, pantry, etc.
2. Plan of the grounds showing the relative positions of the various buildings.

XIX. GRAMPIAN SANATORIUM FOR THE OPEN-AIR TREATMENT OF CONSUMPTION, KINGUSSIE, SCOTLAND.

By Dr. WALTER DE WATTEVILLE.

Plan of the sanatorium. Elevation above the sea level 850 feet. Accommodation for twenty patients. Lighted by electricity.

XX. THE MANCHESTER CONSUMPTION SANATORIUM IN DELAMERE FOREST.

Designed by W. C. HARDISTY, Architect, Manchester.

1. Ground plan.
2. Plan of upper floors and front elevation.

XXI. SANATORIUM ABOUT TO BE ERECTED AT AROSA, SWITZERLAND.

Designed by THOMAS W. CUTLER, F.R.I.B.A., F.San.I., etc., London.

Plan and elevation.

THE ROYAL SEA-BATHING HOSPITAL, MARGATE

ESTABLISHED 1791.

The Earliest Hospital for Tuberculosis.

Ground floor and site plan.

ITALIAN HOSPITAL, LONDON.

Photographs of elevations.

